EBACE the Place for Business

BED OF ROSES FOR TURBOPROPS

DELIVERIES HIGHER FOR LIGHT JETS

GOOD TIMES FOR MROs

ADS-B THE CLOCK IS TICKING

MODIFICATIONS RECOVERING

NBAA SDC 2018 welcomed over 2,900 industry professionals. BART US Editor-in-Chief reports from Long Beach. Page 84

From Las Vegas, Nick Klenske takes a look at the highlights coming out from Heli-Expo 2018. Page 90

BART EU Editor-in-Chief reports from AERO Friedrichshafen. Page 96
CONFIDENCE IS EARNED

That’s why our worldwide 4,000-person-strong customer support network is with you every step of the way. How we serve you is just as important as how your aircraft performs. Discover promise in every journey.

GULFSTREAM.COM
Perfecting our Image

AS THE BUSINESS AVIATION COMMUNITY gathers in Geneva for another edition of EBACE, we can expect a week full of impressive headlines. Our magazine pages will tell about the millions of Euros in contracts that were signed, our social media feeds will be full of images of the latest business aircraft, and our newsfeed will be packed with information on the latest updates and technologies. However, one very important message will likely be missing from the EBACE buzz: the important role that our industry plays in driving business worldwide.

Although the latest jets and the signing of big contracts is exciting for us industry insiders, the outside world just reads ‘more excessive toys for the rich’. This misperception is important, as it gives our industry a bad image. And as we all know, image is everything.

According to a recent report conducted by international communications agency Citigate Dewe Rogerson, just one in three believes our sector has a positive image. That means an astounding 64% describes bizav as being either ‘negative’ or ‘neutral’!

This is unfortunate as it shows that people don’t understand the essential role that Business Aviation plays as an economic enabler. According to the EBAA’s most recent Economic Value and Business Benefits Report, 374,000 European jobs either directly or indirectly depend on the European Business Aviation industry – a number exceeding the total number of jobs in Cyprus. In total, our industry represents EUR 87 billion in output and EUR 32 billion in Gross Value Added, which equals the total GVA of Latvia.

Our industry also enables important business efficiencies. According to the same EBAA report, across all European point-to-point flight routes, Business Aviation flights save an average of 127 minutes when compared to the fastest commercial alternative. In Europe, our sector serves a whopping 25,280 city or area pairs not connected by nonstop commercial flights. In other words, nearly one connection out of three is not connected by any direct commercial flight, meaning the connection would not exist without Business Aviation.

Clearly, we need to do a better job at telling the bizav story. But it’s not just the trade press who must include these stories within our reporting – companies and our industry associations must do so too. In fact, according to the Citigate report, only 11% of individual organizations working in the sector believe companies are ‘very effective’ at developing their brands. More so, 44% of Business Aviation professionals interviewed believe companies operating in the sector are hampered by the industry’s poor image, and only 35% think senior management at these organizations take their brands seriously enough.

In the US, the NBAA is doing an excellent job through it’s No Plane, No Gain campaign, which tells the public about how our industry is a real tool for getting business done. Their dedicated website is a wealth of information that clearly conveys the true story of Business Aviation. But we need to do more, especially in Europe. And what better place to start than at EBACE 2018?

So instead of getting lost in the excitement of contract signings and product launches, let’s make an effort to also tell the story of how all of this equates to economic growth that has the potential to benefit everyone.

See you in Geneva!

“Reality doesn’t bite, rather our perception of reality bites.”

Anthony J. D’Angelo
EBACE 2018
EBACE18 is shaping up to be one of the most exciting yet says Nick Klenske. A preview of EUROPE’S LARGEST Business Aviation event taking place in Geneva, Switzerland on May 29-31.

BUSINESS AIRCRAFT
A review of the airplanes from the Light Jets by Marc Grangier to the Large Cabin/Long Range by Nick Klenske, while Capt. LeRoy Cook sees the turboprops flying on a bed of roses.

AVIONICS
The clock is ticking for FAA and European mandates on the use of ADS-B says Steve Nichols, encouraging operators to look at their upgrade choices before meeting the 2020 ADS-B mandates.

ENGINES
The engine makers continue to power up with new models, new technology, robust sales and more value-added for customers reports Mark Huber.

MRO
Worldwide MRO activity is on the upswing. Mark Huber reports on the reasons of the occurrences.

MODIFICATIONS
Airframe or avionics, the current trend for modifications is too obvious to ignore says Kirby Harrison.

TRAINING SIMULATION
According to Lacy, a good professional pilot is worth investing in, and the best way to do so is via flight simulators. Marc Grangier reports.
OUTSTANDING
The PC-24 combines the versatility of a turboprop with the cabin size of a medium-light jet and the performance of a light jet. The PC-24 has been engineered to be “off-road” compatible from the beginning. Its outstanding short-field performance – even on unpaved runways – opens up an incredible level of mobility. It’s the only aircraft in the SVJ category.

OUR COVER
Located in the middle of Europe, with easy access from Eastern Countries, Russia and Africa, home-base of Bill Lear from 1955 to 1975, when he created the Learjet 23, birthplace and home of the World Trade Organization since 1995, Geneva is also EBACE’s place of origin since 2001. In other words, THE PLACE FOR BUSINESS.
SECURITY TIPS FOR HIGH THREAT DESTINATIONS

Petty crime exists everywhere and risks of violent crime and/or kidnap are prevalent at many international locations. Being aware of and mitigating these risks is an essential trip pre-planning consideration.

KEEP A LOW PROFILE
When in foreign locations it’s always important to be mindful of your surroundings and potential risks and not to look like a soft or visible target. Dress down, do not show expensive jewelry or electronic devices. There was a recent case of an older pilot walking around alone at night in Europe, wearing an expensive Rolex and talking on his phone, who was hit on the head and mugged by someone on a motorbike. To maximize security it’s best to avoid using high profile and expensive makes and models of vehicles. You’re better off with a security trained driver in a nondescript vehicle than a limo.

EXECUTIVE PROTECTION
Many Fortune 500 companies have their own security departments and travel with executive protection personnel. Every country, however, has restrictions on traveling with weapons and you may need to arrange separately for armed and properly vetted local security personnel. Many considerations come into play when hiring local executive protection. You need someone who’s familiar with the region and properly licensed. In some cases you may pick up security personnel at a major business center, perhaps in Dubai or South Africa, and have them travel with you to regional destinations. However, it’s often advantageous to have them arrive at your destination ahead of time to check out items such as hotels, routes to/from the airport, dinner and business meeting locations. To obtain clearance for GA travel to Iraq, you must have security onboard when you arrive.

PROTECTIVE DEVICES
While firearms and Mace sprays are not permitted in most international locations, there are legal devices to enhance security locally. Having a sat phone in regions where your cell phone may not work can be an important security consideration. You may also consider a GPS tracking program for your cell phone so that other crew members, and your company, can track your location. Traveling with a simple door stop is an effective means of boosting security in your hotel room.

HIGHJACK RISKS
While we’re seeing some reduction in brazen kidnap scenarios around the world it’s still happening in many areas. Mexico and Colombia, particularly outside of popular tourist areas, have heightened risks for kidnap but these risks are also present in India and Asia. Risk mitigation strategies help reduce kidnap events, but having insurance to cover this eventuality is also worth considering. It’s important to understand that kidnap risks vary by region and different local scenarios exist. Take additional precautions in kidnap prone areas, such as security trained drivers, armored vehicles and executive protection.

EVACUATION
In higher risk areas it’s important to have contingency plans in place in case you need to get out early. Your 3rd-party provider can advise on options for alternate permits and/or airport slots in case you need to cut a trip short. It’s recommended to have contingency plans ready as well as evacuation insurance in the event of a medical emergency. In a kidnap situation, contact local police, Embassy or Consulate on the ground and follow local laws as best as possible.

CONCLUSION
Although we’ve seen risks and local threat levels go down in certain countries and areas, we do not foresee overall security risks decreasing globally. There is always the potential for violent crimes and kidnaps are always out there. However, taking effective steps, you and your 3rd-party provider can significantly reduce risk throughout most of the world.

QUESTIONS?
If you have any questions about this article or would like assistance in planning security for your next trip, contact Tracie Carwile at Universal Weather traciecarwile@univ-wea.com.
Aviation professionals from around the world trust us to provide the highest-quality training and outstanding service. More than 1,800 highly experienced professional instructors deliver aircraft- and mission-specific courses, using our comprehensive training systems and advanced-technology flight simulators designed to enhance safety. Trust your training to FlightSafety. You’ll see why so many aviation professionals make the same choice. And have since 1951.

For more information, please contact Steve Gross, Senior Vice President, Commercial
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Elbit Systems Ltd. completed the acquisition of the assets and operations of the privately-owned US company Universal Avionics Systems Corporation for a purchase price of approximately $120 million. This acquisition will enable the company to offer a broad portfolio of advanced end-to-end cockpit solutions for commercial OEMs and After Market customers. Following the acquisition, Universal Avionics’ business will continue to operate, with the same management and workforce and under the same name, as a wholly-owned US subsidiary of Elbit Systems.

Rolls-Royce and Airbus have signed a collaboration agreement for the integration of Rolls-Royce’s UltraFan demonstrator for flight testing. The integration solutions demonstration will be co-funded by Clean Sky 2, the European Union research programme focused on developing technology to reduce emissions. UltraFan is a scalable jet engine design suitable for wide-body or narrowbody aircraft and offers a 25% fuel efficiency improvement over the first-generation of Rolls-Royce Trent engine.

Latitude Technologies and Satcom Solutions received EASA Supplemental Type Certificate (STC) on Bombardier’s Dash-8 model aircraft for all Latitude SkyNode SATCOM models, including the latest Safety Services Voice TSO’d S200-012 ATS system. The STC also supports the installation of the IONode Flight Data Monitoring (FDM) system, which is capable of providing fully automated data gathering and distribution, real-time alerting for flight operations and maintenance quality assurance including fuel management programs.

Mexico-based ALE Service Center has completed the first installation of Rockwell Collins’ Venue high-definition cabin management and entertainment system in Latin America. The project, completed at the service center’s facility in Toluca, also included the first non-United States installation of Stage on demand total content delivery solution. “ALE Service Center and Rockwell Collins have been working together for decades, which makes this milestone so important for both of our companies,” said Fernando DosSantos, Rockwell Collins’ director of Marketing/Business Development for Latin America and Canada.
Maintenance
Expertise and Quality with a Personal Touch.

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Victor and Air BP Launch Carbon Offset Program for Private Jet Charters

Leading private jet charter marketplace Victor, in collaboration with Air BP and BP Target Neutral, has officially opened its carbon offset programme to operators and customers following a trial phase which began late last year. The programme aims to put the company, and participating aircraft operators, ahead of the curve in terms of meeting important industry deadlines around reduced environmental impact. According to CORSIA, the International Civil Aviation Organization’s global scheme for carbon offsetting and reduction, aircraft operators will need to purchase offsets for their growth in CO2 emissions above 2020 levels.

CAE Adds to Its Innovative XR Series Training Equipment Suite

CAE announced the launch of the CAE 600XR Series flight training device (FTD), the latest addition to CAE’s innovative XR Series training equipment suite. The CAE 600XR Series, CAE’s latest generation of FTDs, provides the highest training fidelity in today’s fixed-based training market and sets new standards for initial and recurrent pilot training. Featuring a representative flight deck surround with crew seats and fully tactile cockpit with exact panel positioning, the CAE 600XR leverages the proven simulation fidelity, instructor interface, lesson and flight planning capabilities of the CAE 7000XR Series full-flight simulator (FFS).

Arriel 2H obtains EASA Type Certification

Safran Helicopter Engines has received European Aviation Safety Agency (EASA) engine type certification for its Arriel 2H engine, installed in the Avicopter AC312E. This Arriel variant was selected in 2015 to power this helicopter developed by AVIC Harbin Aircraft Industry Group, a subsidiary of Aviation Industry Corporation of China (Avic).
Duncan Aviation recently worked with a customer who wanted extensive renovations on his G-V (Gulfstream V). But before he would sign a contract, he wanted to see how the colors, patterns, and materials all came together. Once he saw the renderings with the materials selected, he signed the contract, and we got to work. We can’t all envision what a finished project is going to look like, and 3D renderings really take away the guess work. Customers are delighted by what we produce. They’re especially pleased that the finished product looks like the renderings.

Visit us at EBACE stand #E89.
www.DuncanAviation.aero
DUNCAN AVIATION INSTALLS NEW GOGO AVANCE L3

Duncan Aviation completed installation of the newly released Gogo AVANCE L3 Wi-Fi system in a Citation 560XLS. The Gogo AVANCE L3 replaces Gogo’s ATG 1000 through 5000 systems and is designed for airframes of all types and sizes, but is ideal for light-to-mid-sized aircraft. The system is scalable with several configurations available as well as a state-of-the-art modem and router.

FLIGHTSAFETY’S BOEING 777-300ER SIMULATOR ENTERS SERVICE

FlightSafety International announces the entry into service of a new Boeing 777-300ER full flight simulator the company built for use by the Japan Air Self Defense Force to train crews for operation of their new VIP transport aircraft. The simulator is installed at the Chitose Air Base in Hokkaido, Japan. The new FlightSafety FS1000 simulator features tightly integrated computer hardware and software across subsystems which allow for more accurate and higher fidelity simulation.

DAHER LAUNCHES “ME & MY TBM” SMARTPHONE APP

TBM aircraft owners and operators were introduced to Daher’s revolutionary new smartphone application that significantly enhances operating efficiency, optimizes maintenance management and ensures they are operating their very fast turboprop aircraft to the highest safety standards. The cloud-based “Me & My TBM” app for Android and iOS leverages data that is automatically collected during every phase of flight. In addition, advanced customer support is now possible at operators’ discretion, as the “Me & My TBM” app gives TBM Care teams the capability to access and analyze all flight parameters in less than one hour after a flight.

ROLLS-ROYCE SELECTS STANDARDAERO FOR 20-YEAR MRO SERVICES AGREEMENT

StandardAero has signed a 20-year Memorandum of Agreement (MOA) with Rolls-Royce to provide MRO services for the AE 2100, AE 1107 and T56 Series IV engine models through the year 2038. The MOA, with a projected value exceeding $15 billion over the twenty year period, designates StandardAero as the primary provider of MRO services, following a competitive bidding process within the Rolls-Royce Authorized Maintenance Center (AMC) networks.
JSSI. A BETTER APPROACH

For nearly 30 years, we’ve provided maintenance support for virtually every make and model of business and regional jet, turboprop and helicopter on the market. Wherever you fly, enhance your ownership experience with a complete range of maintenance, financial and consulting services from JSSI.

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PIPER ANNOUNCES JET-A POWERED SEMINOLE

Piper Aircraft, Inc. selected the Continental Motors Group new CD-170 compression ignition engine fuelled with Jet-A to power the Piper PA-44 Seminole. The world’s leading multi-engine training aircraft will also feature counter rotating engines, giving flight schools and training organizations a single lever, FADEC training system with a history of innovation, simplicity and economy. After selecting the CD-155 Jet-A engine to power the Archer DX, Piper Aircraft extends its Jet-A powered range of trainer aircraft with the PA-44.

BLACKHAWK INTRODUCES PHOENIX PROGRAM

Blackhawk has launched their latest aircraft modernization program; Phoenix by Blackhawk. The program encompasses a complete nose-to-tail customization of legacy aircraft including new or low-time Blackhawk XP Engine+ Upgrades, new or low-time propellers, fresh paint, top-of-the-line interiors, glass cockpit avionics and fresh inspections. To qualify for the program, the aircraft must be of a high pedigree, with impeccable logs since new and no major damage history.

JET AVIATION LEADS INDUSTRY IN DEVELOPING STCS FOR KA BAND CONNECTIVITY

Jet Aviation recently received industry’s first EASA Supplemental Type Certification (STC) for Ka-band system integration on a Boeing 747-400 in Basel. The company is also working on Satcom SBB and Live TV systems installations. It recently demonstrated compliance with the latest EASA bird strike requirement on the Rockwell Collins Live TV Radome. Jet Aviation is investing in connectivity solutions to ensure its customers can enjoy the fastest internet connectivity available in the market for commercial aircraft and private jets.

COMLUX NOW OFFERING WIFI STC FOR BOMBARDIER CL300 SERIES AIRCRAFT

Comlux Completion has been awarded a WIFI Supplemental Type Certificate (STC) STO4290CH on the Bombardier CL300 Series aircraft for the Gogo AVANCE L5 system. The WIFI STC for the Bombardier CL300 Series aircraft is a Gogo AVANCE system that provides 4G in-flight connectivity. It also features video and audio streaming and Gogo Vision on-demand movies. It allows users to connect multiple devices and stay in contact using Gogo Talk and Text.

BAA AND LUXAVIATION CELEBRATE A GROWING INT’L NETWORK ON ALLIANCE ANNIVERSARY

One year on since Business Aviation Asia Ltd. (BAA) and Luxaviation pooled their expertise to form a strategic global alliance, the two world-leading Business Aviation companies have further extended their combined international network to deliver service excellence across the globe. The strategic partnership has brought together a fleet of more than 270 aircraft and 50 helicopters in addition to 1,700 employees worldwide.
Who provides the training you want and the service you deserve?
We do.

Welcome to CAE, home of world-class training where you’ll appreciate more than just programs tailored to your specific needs. With our more personal approach, and centers located in some of the world’s most desirable destinations, you can enjoy a more friendly and cultural experience - our dedicated customer service team is committed to ensuring your needs are met. Elevate your training experience and work with a team that works with you.

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**GULFSTREAM G500 DEMONSTRATES READINESS WITH 8 NEW CITY-PAIR RECORDS**

Gulfstream Aerospace Corp.’s all-new G500 demonstrated both its maturity and reliability by establishing eight new city-pair speed records across continents. The G500 completed the flights as part of a customer-focused world tour. In February, the G500 connected Southeast Asia, the Middle East, Africa, the Caribbean, the US and Europe in record time. Among its record-setting feats, the aircraft flew from Singapore to Dubai, United Arab Emirates, in 6 hours and 54 minutes at an average speed of Mach 0.90, and from Dubai to Lagos, Nigeria, in 7 hours and 35 minutes at the same speed. The G500’s record-setting run continued into March when it linked Africa to South America with a flight from Luanda, Angola, to Foz Do Iguaçu International Airport in Brazil.

**DAHER INTRODUCES GARMIN’S LATEST G3000 FEATURES ON TBM 930**

Daher announced its introduction of the latest features and functionality on Garmin G3000 all-glass integrated flight deck configuration for TBM 930s – the high-end model in Daher’s very fast turboprop aircraft family. New functions available with the flight deck’s latest software version include: Surface Watch, which helps the pilot maintain enhanced situational awareness in the airport environment, Baro VNAV, allowing approaches with vertical guidance when Wide Area Augmentation System navigation is not available, and Visual approach to assist the TBM pilot in performing visual approaches on non-controlled airports with vertical guidance.

**HONDAJET RECEIVES ARGENTINIAN AND PANAMANIAN TYPE CERTIFICATIONS**

The HondaJet has received type certifications from Argentina’s Administración Nacional de Aviación Civil (ANAC) and Panama’s Autoridad Aeronáutica Civil (AAC). The announcement was made at the International Air & Space Fair (FIDAE) in Chile where the HondaJet is being showcased for the first time. The HondaJet holds many type certifications around the world, including, but not limited to, the United States, Europe, Mexico, Canada and Brazil.

**G1000 NXI UPGRADE ANNOUNCED FOR PHENOM 100/300**

There are two new members in the G1000 NXi upgrade club – the Embraer Phenom 100 and Phenom 300 equipped with the Prodigy Flight Deck. This integrated flight deck upgrade includes significant performance enhancements, plus unique features such as Surface Watch, visual approaches, geographical map overlay within the HSI and more. Supplemental Type Certificate for the G1000 NXi integrated flight deck upgrade on the Phenom 100/300 is targeted for approval in Q1 2019 and will be available from select Garmin dealers and Embraer service centers.
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Design and people working beautifully together
The purpose-built airport for BUSINESS, for PRIVACY, for LONDON

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EMBRAER SERVICES & SUPPORT COMPLETES FIRST UPGRADE OF PHENOM 300

Embraer Services & Support has completed the first upgrade of a Phenom 300 light business jet with a two-person divan, increasing cabin passenger capacity to 11 occupants, the highest in its class. The first upgrade was completed at Embraer’s Customer Service Center in Sorocaba, Brazil, through the implementation of a service bulletin, which is now available and applicable to the entire global fleet of more than 430 Phenom 300 in operation in about 30 countries.

GULFSTREAM LEADS INDUSTRY IN CABIN CONNECTIVITY

Gulfstream Aerospace Corp. recently delivered its 100th aircraft featuring the global high-speed Wi-Fi system known as Jet ConneX. “Gulfstream has delivered more aircraft with Jet ConneX than any other original equipment manufacturer,” said Rupert Pearce, chief executive officer of Inmarsat, the leading provider of global mobile satellite communications services and owner of the satellite network that operates the lightning-fast Ka-band internet service.

JET AVIATION COMPLETES ACQUISITION OF HAWKER PACIFIC

Jet Aviation has completed its acquisition of Hawker Pacific, a leading provider of Civil MRO, Fleet and FBO Services, and Aircraft Sales across Asia Pacific and the Middle East. The transaction is valued at US$250 million. As part of this acquisition, Jet Aviation will add 19 locations across Asia Pacific and the Middle East to its global network, including 7 FBOs, 14 MRO facilities and over 400,000 sq ft of hangar space. More than 800 employees will also become a part of Jet Aviation.

PILATUS APPOINTS CUTTER AVIATION AS AUTHORIZED SALES AND SERVICE CENTER

Cutter Aviation joins the award-winning Pilatus network to provide sales and service for the PC-12 and PC-24 Super Versatile Jet in the Southern California, Arizona, New Mexico, Texas, and Colorado region. As part of Pilatus Aircraft Ltd’s continuous efforts to remain the top-ranked service network in Business Aviation, the company announced that Cutter Aviation will become its newest Authorized Pilatus Sales and Service Center. Cutter will join long-time Pilatus Centers Western Aircraft, KCAC Aviation, Epps Aviation, Skytech, and Pro-Star in providing sales and service for customers in the United States.

WEST STAR’S CHA PAINT HANGAR EXPANDS

West Star’s new 48,380 sq. ft. paint hangar and over 90,000 sq. ft. maintenance hangar in Chattanooga will be operational by end of 2018. The new facility is an authorized service center for Embraer aircraft and once the expansion is complete, it will have all the full-service capabilities of ALN and GJT while providing our Eastern customers an MRO option.
Live your dream. We care about the details. Our portfolio of services is a class of its own and makes us the best partner for VIP, government and special mission aircraft of any type. Ranging from market-leading completions and modifications to meticulous technical support, it shines in every facet of the life cycle of the aircraft. Our uncompromising support meets even the most individual demands - and lets you embrace every moment on board.

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RUAG First in Europe to Complete 2020 FANS 1/A+ on Falcon

RUAG Aviation has successfully upgraded a Dassault Falcon F2000 to comply with the FANS 1/A+ requirements of the aviation regulatory mandates for 2020. The first modification of this kind completed in Europe, the FANS 1/A+ avionics upgrade was achieved ahead of the compliance deadline. The integration of the avionics upgrade was carried out at RUAG Aviation’s Dassault Falcon service center facilities in Lugano-Agno, Switzerland.

Air Service Basel Serves Baselworld’s Niche Clientele

Air Service Basel had a productive week serving the needs of Baselworld’s niche clientele with high-end services and efficient support. Despite the show’s scale-down this year – focusing on quality of products over quantity – the FBO served nearly 60% more traffic than in 2017. The Baselworld show is home to more than 800 high-end exhibitors at Messe Basel unveiling new products and trends in the watch and jewelry market to nearly 150,000 visitors – including retailers and the media.

BendixKing Introduces XVUE Touch Flight Display

BendixKing, a unit of Honeywell, has introduced xVue Touch, a primary flight display for experimental aircraft. Available now, the new cockpit technology provides builders and pilots with a powerful and intuitive touchscreen flight display built with superior craftsmanship, at a very affordable price. The new flight display represents a major milestone for BendixKing as its first product specifically launched for experimental category aircraft.

SmartSky Introduces First 4G LTE-Based Connectivity for Light-Jet and Turboprop

SmartSky Networks has introduced its new SmartSky Lite connectivity technology, designed to bring 4G LTE air-to-ground cellular connections to light jets and turboprops with up to 19,000 pounds max takeoff weight. The Lite system will offer the same 4G LTE network speed as SmartSky’s current system for midsize and larger jets, but is limited to six devices on board. The Lite system is expected to cost less than $50,000, and early adopters can take advantage of a promotional offer of airtime at a fixed rate of $75 per hour, which includes unlimited data.

SR Technics Improves Infrastructure and Capacity

SR Technics is extending its capabilities and improving its services around the world to even better serve its airline customers while adapting its global footprint to the respective market conditions. After a detailed review of its operation, SR Technics considers to right-size its infrastructure and capacity at Zurich Airport by adding more than 100 new positions in Engine Services and potentially reduce its workforce in Aircraft Services of up to 300.
Get ready to experience the largest, tallest and widest cabin in business aviation. The Falcon 6X has a 5,500 nm (10,186 km) range and a top speed of Mach .90. In setting a higher, wider standard, it truly stands alone. Falcon 6X. The roomiest, most productive 5,500 nm you’ll ever experience.
DASSAULT INTRODUCES THE FALCON 6X
Dassault Falcon has introduced the newest addition to the Falcon Family: the long-range, ultra wide-body Falcon 6X. The Falcon 6X defies categorization with a cabin cross section that will be not only the largest in the Falcon line, it will be the largest in Business Aviation. The Falcon 6X continues the Dassault tradition of creating aircraft that combine innovative technology, flexibility, efficiency and elegant design. With a range of 5,500 nm (10,186 km) and speed up to Mach .90, the 6X will be able to fly nonstop between most major business centers in the world.

UASC TOOL FOR INSIGHT DISPLAY SYSTEM NOW AVAILABLE
Universal Avionics has released the External Configuration Editor (ECE) for the InSight Display System. The new web-based configuration tool makes the pre-design and system configuration process simple and intuitive. As a cloud-based application, the ECE provides installers the ability to design the configuration from the convenience of a personal computer and share configurations across their organization. Built-in collaboration tools help to streamline workflow among installers.

AIRBUS HELICOPTERS STRENGTHENS POSITION AS UK MARKET LEADER
Airbus Helicopters UK has defied market conditions with a new high of 14 civil aircraft booked in 2017, demonstrating a year-on-year average growth in the civil market of 36% since 2013. As a result, the company has reinforced its position as UK market leader with 46% of the civil and parapublic market. This follows the company’s long-term commitment, made in 2015, to invest in increasing its industrialization in the UK.

MTU POWER: NEW BRAND FOR GAS TURBINE BUSINESS
MTU Aero Engines AG launched a new brand to improve transparency in services for gas turbine customers. The new brand is called MTU Power and consolidates the existing gas turbine engineering, manufacturing and aftermarket expertise and services from the business units Aero Solutions, Brush Seals and MTU Maintenance at MTU.

NBAA MARKS PASSING OF AVIATION SAFETY ADVOCATE RICHARD COLLINS
The National Business Aviation Association (NBAA) marked the passing of Richard L. “Dick” Collins, a leading aviation journalist and lifelong safety advocate, who died at his home in Maryland on April 29. He was 85. In 2000, NBAA recognized Collins with the association’s Platinum Wing Award for lifetime achievement in the field of aviation journalism.
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QUICK LANE

FLYING COLOURS RAMPS UP PRODUCTION AS DOORS OPEN AT NEW ST. LOUIS FACILITY

Flying Colours Corp. has officially opened the doors of its new St. Louis, MO., facility. Manufacturing at the new facility, which primarily supports the design, build and finishing of woodwork monuments for large business jet cabins, has already begun. The industrially designed floorplan was created with lean manufacturing operating principles at its core. This improves efficiency, and combined with the additional workshop space, is set to increase St. Louis productivity by 600% during the first year. To support working with composite materials a new “Edge Fill” machine fills the voids in composite panels after being cut and shaped by the CNC machine.

TAG AVIATION ASIA OPENS NEW TRAINING CENTER IN HONG KONG

TAG Aviation Asia celebrates the opening of its new training center in Hong Kong. This state of the art training facility with its modern design and advanced training aids will provide quality training to every guest, colleague and trainee. In addition, TAG Aviation Asia is the first corporate management company in the region to offer training services that include a physical Airbus A320 Over-wing Exit Door Trainer.

CITATION LONGITUDE CIRCLES THE GLOBE

Textron Aviation Inc. announced the Cessna Citation Longitude has successfully circumnavigated the globe, demonstrating its commanding performance and impressive reliability to customers along the way. Throughout its world tour, the Longitude traveled more than 31,000 nautical miles, flew 27 legs and visited 12 countries. “This far-reaching tour enabled us to fulfill the mounting demand from customers around the world to experience this stunningly capable and impressive aircraft,” said Rob Scholl, senior vice president of Sales and Marketing.

AVFUEL BRANDS NEW AMELIA ISLAND FBO

Avfuel welcomes Bent Wing Flight Services, Fernandina Beach Municipal Airport’s new FBO, to its branded Network of Independents. Bent Wing Flight Services took over as KFHB’s only FBO in April, and will move into a new terminal in June. The FBO will provide its full array of services out of a temporary terminal until that time. “We look forward to serving the airport’s customer base with excellent, professional care,” said Brian Echard, Bent Wing Flight Services’ owner.
Universal Aviation's Rome Ciampino facilities have been through a complete overhaul. The result is a classy welcoming facility with a local flavor, reports Volker K. Thomalla.

Italy is among the most popular destinations for Business Aviation in Europe with Rome Ciampino ranking regularly in the top 10 Business Airports in Europe. The airport Authority Aeroporti di Roma (ADR) has rebuilt its General Aviation Terminal (GAT). Universal Aviation, the ground support division of Universal, is serving its customers in 20+ countries. In Italy, four locations (Milan Linate, Milan Malpensa, Venice Marco Polo and Rome Ciampino) are operated under Universal Aviation Italy. In Rome Ciampino, Universal is based in the GAT and has seized the opportunity to renovate its ground support facilities. On March 28, Universal officially inaugurated the new facilities with a ribbon-cutting ceremony, which was well attended by clients, partners and dignitaries.

“The renovation of our facilities in Rome Ciampino reinforces Universal’s commitment and Greg’s vision to accommodate our customers to the highest standards, delivering not only a successful mission but a Universal experience provided by the Universal team and family in over 20 countries today,” said Claudia Evans, who spoke in honor of husband Greg Evans, chairman, Universal. “And we are continuing to expand with over 1,700 employees around the world providing an impeccable service every day.”

Universal’s new Ciampino facilities include a VIP lounge for passengers which offers an unobstructed view of the apron, a crew rest lounge in the first floor, a crew business center and a modern operations office. The complete overhaul took a little more than a year. The design style of the facility is classy with a clear local flavor. “It’s important to adapt to the local style. Standard is no added value for our customers. The cultural connection to the location is important,” said Lorena Carraro, managing director, Universal Aviation Italy. She added: “Our priority for this renovation was to dedicate private spaces for crews and passengers, as well as the highest level of amenities and features that are important to our clients. With passion and commitment, we are proud to offer our clients a warm welcome, granting them a unique experience in the ‘eternal city’ of Rome.”

Charlie Mularski, senior vice president, International at Universal, said that Universal handles around 10,000 movements annually. There’s no limit to the size of the aircraft that Universal can support. “We’ve handled everything from the single engine aircraft up to a Boeing 747-8.” Speaking to BART International, he highlighted the quality of cooperation with the local authorities. Ground support facilities are a key component for every Business Aviation mission. Universal offers not just ground handling or flight planning for its customers, but end-to-end-solutions for every single flight. “We reduce our customer’s operating risk and stress by accessing a global community of resources dedicated to helping them prepare for unforeseen events.” He added that Universal Aviation has invested a “couple of hundred thousand dollars” into the refurbishment of the Ciampino facility.
Garmin International, Inc., announced the inReach Mini, a smaller and more compact satellite communicator with available two-way messaging and a 24/7 SOS function when combined with an inReach subscription to access the Iridium satellite network. Measuring just under 4 inches tall by 2 inches wide, and weighing 3.5 ounces, the inReach Mini can easily be carried in a backpack, boat, plane, or glovebox.

Textron Aviation Inc. has completed initial wind tunnel testing of its new twin-engine Cessna SkyCourier turboprop. Results from comprehensive wind tunnel tests will provide performance and aerodynamic characteristics and structural load data, further finalizing the aircraft design. “For the initial wind tunnel testing, we use a custom, precision model with electric motors and scaled propellers calibrated to represent the thrust produced by the real aircraft,” said Brad Thress, senior vice president, Engineering.

Bombardier Business Aircraft launched 12 brand new product enhancements, from situational awareness and regulatory compliance to cabin upgrades to elevate the performance, comfort and luxurious aesthetics of its in-service aircraft. These products are available for installation by the qualified experts who know the aircraft best and can reduce aircraft downtime by combining the installation with a major inspection at any of Bombardier’s nine service centers worldwide.

Duncan Aviation has completed the acquisition of MRO repair services from Capital Avionics. This acquisition bolsters Duncan Aviation’s recent designation as one of only four BendixKing service partners in North America, and 14 worldwide authorized to repair, overhaul and sell BendixKing components. Duncan Aviation has 50 years of experience supporting and servicing BendixKing components and has built an extensive list of repair and overhaul capabilities.

World Fuel Services (WFS) has entered into a new long-term partnership with XLR Executive Jet Centres (XLR) to provide fuel and complete technical services to its Birmingham Airport facility. XLR’s corporate aviation facilities at Birmingham Airport include a state-of-the-art executive suite for passengers, dedicated crew facilities and a 27,000-square foot heated hangar.

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RAISBECK RECEIVES ANAC STC APPROVAL FOR COMPOSITE FIVE-BLADE SWEPT PROPELLER

Raisbeck Engineering, Inc., has received Supplemental Type Certificate (STC) approval from the National Civil Aviation Agency of Brazil (ANAC) for its Composite Five-Blade Swept Propeller for the King Air 350 series aircraft. In addition to ANAC STC approval, the Composite Five-Blade Swept Propeller has received certification from the FAA (Federal Aviation Authority) and Australia, with Transport Canada and EASA (European Aviation Safety Agency) approvals expected soon.

FORBES NAMES FLIGHTSAFETY INT’L ONE OF AMERICA’S BEST MID-SIZE EMPLOYERS

FlightSafety International has been named one of the best mid-size employers for 2018 by Forbes. The Forbes list recognizes America’s best 500 large employers and 500 mid-size employers across 25 different industries. Bruce Whitman, chairman, president & CEO commented: “This important recognition is due in great part to our teamwork, respect for each other, open communication, and family atmosphere. We are committed to continue to attract and keep the very best people and to ensure FlightSafety remains as one of the top places to work in aviation.”

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ON THE MOVE

PEOPLE

Comlux Completion has appointed John Fleeman as the new head of Maintenance. Fleeman is joining the Comlux team after 21 years at Associated Air Center in Dallas.

West Star Aviation appointed Pete McKernan as senior vice president of Parts and Component Repair. McKernan will be responsible for overseeing West Star Aviation landing gear and accessory departments along with their affiliates, Avant and DAS.

Universal Avionics announced the appointment of Curtis Thelen to the position of CFO for the company. Thelen transitions into this new role as predecessor Michael Delgado retires after 20 years with the company.

Aerion has named Tom Vice, the former president of Northrop Grumman’s Aerospace Systems sector, as Aerion’s president and COO. He will play a leading role in the development of the company’s AS2 supersonic business jet.

Jet Aviation announced the new set-up of Jet Aviation’s Communications Department under the leadership of Elouisa Dalli, head of Global Communications, reporting to Heinz Aebi, senior VP Marketing & Communications.

Elouisa Dalli

StandardAero has appointed Marc Drobný as president of the company’s Business Aviation division. Drobný replaces Marc McGowan who is retiring, after six years with StandardAero.

FlightSafety International announced that Suren Meras has been promoted to senior director, Operations. Meras oversees FlightSafety’s pilot, dispatch and instructor training.

Keith Anderson has joined the company as director of Engineering for simulation products. Anderson is responsible for all aspects of the design, development and support of FlightSafety’s training devices. Lastly, Joe Warakomsksi has been promoted to CIO. He is responsible for all aspects of FlightSafety’s Information Technology programs.

Jet Support Services, Inc. (JSSI) has named Jeff Soderberg director of business development for the Southwest region of the United States, including Southern California.

Jason Schwab has been named president of JSSI Advisory Services. In this new role, Schwab will lead the company’s growing range of aircraft consulting services and subscription products. Also, JSSI has appointed Ikhsan Alfahmi to the role of director of Business Development for South East Asia. He will be based in Indonesia, reporting to JSSI’s Hong Kong office.

Duncan Aviation in Provo, Utah, announced that Enrique Marquez has accepted the Gulfstream/Embraer Airframe Team Leader position. With 36 years of aviation experience, Marquez will be instrumental in establishing the critical resources required to successfully service large Gulfstream/Embraer projects in the new Provo hangars.

Meanwhile, former Controller Jamie Harder has assumed the roles of Duncan Aviation’s vice president and CFO and joined the Senior Management Team. In her new roles, Harder will provide leadership for the Accounting Department and the Credit, Information Technology, Materials and Treasury Services.

Frank Walschot

SR Technics announced the appointment of Mireia Gaona as general manager for SR Technics Spain and Frank Walschot as CEO, replacing Jeremy Remacha. Walschot is a recognized and respected senior executive, well trusted with SR Technics’ business and challenges for many years.

Air Partner PLC announced the appointment of Chris Mann as interim CFO. Mann is a chartered accountant who has worked in finance positions at senior level within a range of listed and private companies. Also, Ian Holder has been appointed as managing director at Baines Simmons. Holder will report directly to Air Partner CEO Mark Briffa and will also sit on the Group’s Operating Board.

Baker Aviation announced that Scott Goodley has been appointed to director, Quality Assurance and Chief Inspector. As an Airframe and Powerplant licensed mechanic with Inspection Authorization, Scott Goodley has served the business aviation community for more than 38 years.

Kopter Group AG announced the appointment of Larry D. Roberts as senior vice president, US Business Development responsible for the sales, marketing of the SH09 single-engine turbine helicopter in North America. Roberts will be based in Dallas/Ft. Worth, Texas.

Vincent Mascré has been appointed chairman of the Executive Board of Zodiac Aerospace and CEO of the company’s Seats business. Following this appointment, Jean-Paul Alary replaces him as CEO of Safran Landing Systems, and Cédric Goubet will succeed Alary as CEO of Safran Nacelles.

TAG Aviation Europe has announced the appointment of Victoire Totah as business development director for the French region. Totah will be responsible for the development and growth of aircraft management and charter opportunities within France, Monaco and Benelux. TAG Aviation Europe also announced the appointment of Karl Mills as charter manager for the UK. In his new role, Mills will be responsible for providing direction, training and development to the UK-based charter team.

Southeast Aerospace welcomed Luke Gomoll as their new Aircraft Modifications Sales representative. Gomoll brings 10 years of Aircraft Modification experience.

West Star Aviation announced an enhancement to their leadership team by adding Jim Rankin as CEO. Bob Rasberry has been named chairman of the Board, and Rodger Renaud will remain president and COO. The company has taken a proactive approach in strengthening its leadership team to ensure its continued success in delivering industry-leading service to its customers during a time of rapid growth.

Jim Rankin
Looking for down-to-earth attitude at high altitude?

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BUILDING ON THE SUCCESSFUL and award-winning SESAR Augmented Approaches to Land (AAL) project, a consortium of key aviation stakeholders (airports, airspace users, airframe manufacturers, avionics manufacturers and regulatory bodies) has come together to launch AAL2. It aims to demonstrate augmented approach and landing operations and will run from 2018 to 2020. Specifically, AAL2 will work on the following SESAR solutions:

- **GBAS (Ground Based Augmentation System) CAT II with CAT I airborne and ground equipment**, enabling lower decision heights to CAT II minima (DH 100ft) (addresses hubs and medium size airports)
- **EFVS (Enhanced Flight Vision System) to Land using Head Up /or Mounted Display**, with operational credit down to 300 meters RVR in non-CAT II/III airports (addresses medium and small size airports)

AAL2 will provide important benefits, including improved accessibility in congested, low visibility conditions - complementing currently limited systems - to pave the way for the uptake of technologies required to overcome limitations of the current Instrument Landing System (ILS) equipment. This will contribute to Air Traffic management (ATM) modernization by speeding up deployment.

The AAL consortium includes:
- 5 small/medium sized airports: Antwerp, Le Bourget, Payerne, Bremen, Perigueux;
- 2 large airports: Frankfurt and Newark;
- 6 Airspace Users: HOP I, EBAA, Lufthansa Group, Ryanair, Flying Group, and Zurich Insurance;
- 4 ANSPs: Belgocontrol, DFS, DSNA and Skyguide;
- 3 airframe manufacturers: Airbus, ATR, Dassault-Aviation;
- 2 avionics manufacturers: Honeywell, ELBIT;
- 7 regulatory bodies: BAF (German CAA), BCAA (Belgium CAA), DGAC (French CAA), EASA, FOCA (Swiss CAA), IAA (Irish CAA), LBA (German CAA);
- 3 European or Intergovernmental organizations: EASA, ESSP, Eurocontrol;
- 1 Instrument Flight Procedure Expert: DLR.

AAL2 builds on AAL, a project which developed and demonstrated several augmented approach procedures for small and medium-sized airports, using advanced procedures based on four different technologies: Ground and Satellite-based Augmentation System (GBAS/ SBAS Advanced), Synthetic Vision Guidance System (SVGS), Enhanced Flight Vision System (EFVS). The aim of the project was to pave the way for the uptake of these technologies, which are needed to overcome the limitations of the current ILS – equipment which is costly to install and maintain, and which can only guide straightforward approaches by aircraft.

AAL saw 15 partners from across the aviation sector worked closely together to deliver one of the most ambitious large-scale demonstrations in Europe. It demonstrated, through some 360 trial flights, that satellite-based navigation and augmented vision can improve access and reduce the impact of Airspace Users on the environment.

As the technological pillar of Europe’s ambitious Single European Sky (SES) initiative, SESAR was established in 2017 and is the mechanism which coordinates and concentrates all EU R&D activities in ATM, pooling together a wealth of experts to develop the new generation of ATM. Today, SESAR unites around 3,000 experts in Europe and beyond.

In cooperation with its AAL2 consortium partners, EBAA is excited to create clear benefits, such as improved accessibility, alleviating airport and airspace traffic (particularly in congested, low-visibility conditions) and provide better connectivity throughout the European airspace.
The European Business Aviation Association (EBAA) has published an Economic Value and Business Benefits Report, outlining clearly the value derived by the European economy from the activity of Business Aviation.

The report, commissioned by the EBAA and produced by Booz Allen Hamilton in collaboration with Deutsches Zentrum für Luft-und Raumfahrt (DLR), examines the economic impact of the Business Aviation sector on the European economy (EU28 incl. Monaco, San Marino, Gibraltar, Channel Islands, Island of Man, Norway, Switzerland, Liechtenstein), building on a similar report published in 2016.

In three distinct areas, the report quantifies the value that Business Aviation brings to the European economy and businesses more specifically. First, it outlines how Business Aviation is enabling economic growth through the jobs and investment that it makes. Second, it showcases how Business Aviation is helping drive efficiencies across businesses, quantifying the time and costs savings that can arise. Finally, it demonstrates how Business Aviation can support better connectivity across Europe, particularly from hard to reach corners of the continent.

Through engaging infographics, the report then moves on to outlining the individual contribution made in each of the EU28, Switzerland, Norway and Iceland.

Speaking ahead of the report’s launch at the Annual General Meeting of the EBAA, Chairman Juergen Wiese, said: “As we gather here in Brussels as a Business Aviation community, it is helpful to be reminded of the total contribution made by the sector. From the substantive number of jobs to the simple societal benefits – such as air ambulances and medical evacuations – the sector provides a huge amount of value for the European economy and to European business.”

EBAA’s Chief Operating Officer, Robert Baltus, added: “Up and down the European continent, Business Aviation is creating jobs and enabling new investment, something that is often forgotten. Without Business Aviation in some regions, business connectivity simply would not be possible, and as a result new ventures and opportunities would never be realized. This is something positive which we must recognize, and this report aims to quantify what specifically that benefit/value looks like.”

Key Facts About Business Aviation
○ A total of some 374,000 European jobs are either directly or indirectly dependent on the European Business Aviation industry – a number exceeding the total number of jobs in Cyprus.
○ The industry represents €87 billion in output and €32 billion in Gross Value Added (GVA), which equals the total GVA of Latvia, and €25 billion spent in salaries.
○ The effect of Business Aviation over the EU28 GVA is about 0.19%.
○ France, Switzerland, Germany and the UK are the main players in the sector, producing 76% of the total GVA of the industry.
○ Out of the above total, 192,000 of the sector’s jobs stem from the operation of business aircraft, i.e. jobs with aircraft operators, maintenance firms (MROs) and ground handlers/fixed-base operators (FBOs).
○ Across all European point-to-point flight routes, Business Aviation flights save an average of 127 minutes, when compared with the fastest commercial transportation alternative.
○ Although certain long-haul flights might be faster with commercial jets due to higher ground speed, about 20% of Business Aviation flights result in more than five hours of time saved than their best commercial alternative due to delays avoided and time saved in airport procedures.
○ Business Aviation in Europe serves 25,280 city or area pairs not connected by nonstop commercial flights (direct flights), which represent approximately 31% of total city pairs analyzed. In short, nearly 1 connection out of 3 is not connected by any direct commercial flight, meaning the connection wouldn’t exist without Business Aviation.
○ For the eight city areas considered, on average, Business Aviation increased the number of direct connections to a city by more than 450% compared with regularly scheduled commercial aviation.
○ Business Aviation allows for air ambulances and medical evacuations to be provided to and from remote regions. According to EBAA data, 12,000 departures were flown to serve medical evacuations representing more than 50 departures a day.
○ Since Business Aviation requires fewer connections and is subject to fewer delays, it represents an optimized travel option from an environmental perspective.
MAINTAINING BUSINESS AVIATION access to airports throughout Europe remains a significant concern for operators across the region, and these concerns will be addressed during a dedicated session at the 2018 European Business Aviation Convention & Exhibition (EBACE2018) in Geneva, Switzerland from 29-31 May.

In the United Kingdom, economic pressure on airports to accommodate low-cost air carrier operations threatens to squeeze out business aircraft that must compete with airliners for available slots under EU Regulation 95/93, which states general aviation and Business Aviation receive only those slots that are not taken by scheduled operators. The situation has increasingly resulted in Business Aviation planners and third-party handlers having to advise passengers they might not get what they want in terms of desired landing or takeoff times at their preferred airport. “Airline traffic is growing, and Business Aviation is last in the long queue for the slots,” noted Olga Krasowska, manager of airport operations for the European Business Aviation Association (EBAA).

Competition for landing and takeoff slots at Luton, Stansted, Heathrow and Gatwick airports is further complicated by noise-related night curfews from which business aircraft were once exempt. “Previously, business aircraft were exempt from the night quota and could operate freely,” Krasowska noted. “But the London airports recently proposed new rules for night flights that included business aircraft in the noise quotas of the airports.”

At London’s Stansted Airport, these revised noise calculations resulted in business aircraft exceeding noise footprint standards for which they had not been previously required to register. “Effectively, it would have meant that Stansted was closed to Business Aviation,” noted Marc Bailey, chief executive of the British Business and General Aviation Association (BBGA), who described the Stansted calculation as “an unintended consequence of somebody doing a piece of consultation without understanding what was going on. “When people realized this wasn’t practical, it was pushed back to the local airfield to discuss,” he continued. “At the moment, it
looks like there will be some grandfathering of access to the slots that doesn’t preclude Business Aviation from operating.”

The upcoming UK “Brexit” from the European Union adds another wrinkle to the situation, with concerns over valuation of the British pound, cabotage issues for EU-registered aircraft and possible diminishing of the European Aviation Safety Agency’s jurisdiction over the region. With these and other concerns in mind, the BBGA and other general aviation advocates are working with the UK’s Civil Aviation Authority to address a Department for Transport tender to develop a master plan for “what the network of airfields in the UK will look like to support aviation as a whole” in 2050. Bailey emphasized this team-driven approach is vital for ensuring that Business Aviation concerns are properly represented in that process. “You have to go have these tactical-type battles, marshal your forces, and win them over on arguments,” Bailey suggested. “You have to intervene as an association. You can’t do it as individual operators; you have to combine [forces] and take a one-voice position so it elevates the issue enough so [airport] people are forced to have those discussions and come to a compromise.”

Of course, such concerns over airport access are not limited to the UK. On Wednesday, 30 May at EBACE2018, the session “European Airports – The Access Challenge” will focus on the challenges operators face to get access to airports across the EU preferred by their customers, with perspectives from a range of industry stakeholders. EBACE2018 will take place at Geneva’s Palexpo convention center, with a static display of business aircraft adjacent to the exhibit floor at Geneva Airport.

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First quarter 2018 performance showed a positive trend on the heels of a 27% growth in billings for 2017. Airplane deliveries increased more than 36% to 34 aircraft in the first quarter of 2018, up from 25 airplanes during the first quarter of 2017. New aircraft sales revenue grew more than 77% to $41,379,227, when compared to sales of $23,383,514 during the same period the previous year. The growth in revenue reflects strong demand for M-class products with the M600 sales expanding by more than 100%.

**Piper’s Deliveries and Revenue Rise in 1Q18**

Piper Aircraft Inc. announced its aircraft sales and delivery results for the first quarter of 2018, ending March 31. The company continued to grow its new aircraft deliveries and revenue with the company’s flagship product, the turbine powered, M600 leading the company’s performance success. Additionally, Piper trainer sales growth continues to be led by the proven Archer platform with sales backlog into Q3 2019.

**FAI Technik Reports Record Results in 2017**

FAI Technik, the maintenance division of Germany’s FAI Aviation Group, has reported record financial results in 2017 achieving revenues of €9.7M for the first time in the company’s history. The division’s revenues mark a significant increase of 40% compared with 2016.

Siegfried Axtmann, FAI Group chairman, comments: “We are extremely pleased to close the year with record results. Our excellent performance was driven by our ability to expand our capacity to meet a growing demand for MRO-services. I am very proud of our organization as we continue to develop our MRO-business.”

The company inaugurated its new 4,500 m² carbon neutral Hangar 8 last year, the largest general aviation hangar complex in Germany complementing its existing 2,000 m² Hangar 6 and 3,000 m² Hangar 7.

**JSSI Reports Record Start to the Year**

Jet Support Services, Inc. (JSSI) has released the JSSI Business Aviation Index for the first quarter of 2018. The index tracks utilization of approximately 2,000 business aircraft worldwide and reports average flight hours flown on a monthly basis by region, industry and cabin type. Flight hours in the first quarter of 2018 were at the highest level in any first quarter since 2008.

“The end of 2017 saw the highest flight hour activity since the peak of 2008. While the first quarter of the year often sees a material drop in flight hours, the first quarter of 2018 dropped only 0.3 percent,” said Neil W. Book, president and CEO of JSSI.

Average flight hours increased 2.9 percent year to date. Average aircraft utilization of 27.97 hours for the first quarter represents the highest level during this period since 2008.

Many of the nine industries within the latest index reported significant year-over-year increases in the first quarter. The growth was primarily driven by the aviation sector, which saw an 8.4 percent increase in flight activity compared to the same period last year.

**Embraer Releases Earnings Results for 1Q18**

In 1Q18, Embraer delivered 14 commercial and 11 executive aircraft (8 light jets and 3 large jets), for a total of 25 jets delivered during the quarter. This compares to 1Q17 deliveries of 18 commercial jets and 15 executive jets (11 light and 4 large). The company’s first quarter deliveries are generally the lowest in terms of seasonality, and Embraer remains confident in its 2018 guidance for 85 to 95 total commercial jet deliveries and 105 to 125 total executive jet deliveries (70-80 light jets and 35-45 large jets). The company expects deliveries for both the Commercial Aviation and Executive Jets segments to improve in 2Q18.

Consolidated gross margin improved from 16.7% in 1Q17 to 18.3% in 1Q18, driven by year-over-year improvement in the Commercial Aviation, Executive Jets, and Defense & Security segments.

In the first quarter, Embraer Executive Jets delivered the first Phenom 300E business jet, after receiving its type certificate from the FAA, EASA and the Brazilian Civil Aviation Agency. The new light jet model was launched – and debuted – at the 2017 National Business Aviation Association’s (NBAA) event in October 2017.
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BOOTH# W107
EBACE 2018 is shaping up to be one of the most exciting yet. And yes, we know, we say that every year – but this time we really mean it. After all, it’s not every year that EBACE kicks off with a jet pack!

Nick Klenske reports

What was once a science-fiction fantasy is now making its way into the world of Business Aviation. Yves Rossy, inventor of a series of experimental individual jet packs, will inspire attendees and set the tone for an innovative, forward-thinking show during the Opening Session on May 29th. “I’m very pleased to be part of EBACE2018 where I will have the opportunity to share with you a new kind of flight,” says Rossy. “We are closer and closer to realizing one of the oldest dreams of mankind – to fly like a bird.”

Rossy’s message of learning to ‘fly outside the box’ is aligned with EBAA’s Expanding Horizons campaign, which seeks to provide education about, and positively establish perceptions surrounding, the value and benefits of Business Aviation to Europe. “Business Aviation is critical to the economy of Europe, providing access to more than three times the city pairs provided by scheduled carriers,” says EBAA Director of Communications Eric Drosin. “Yet many people are unaware of the vital connection that BizAv provides communities in Europe, and the Expanding Horizons campaign aims to promote the value and contribution of the industry across the Continent.”

On 30 May, the EBAA is hosting a Communicators Breakfast, where industry members can learn more about the campaign and how they can use social media to share the value of Business Aviation in Europe.

Big Numbers Expected

Being the only European show dedicated exclusively to Business Aviation, EBACE brings together the industry’s aircraft, equipment and experts under a single roof. Taking place May 29 - 31 at Geneva’s Palexpo, organizers are expecting to welcome 13,000 attendees and over 400 exhibitors coming from all corners of the planet.

Furthermore, the static display – which is conveniently located just outside the exhibition hall doors – will boast at least 55 aircraft from the likes of Airbus, Dassault Falcon, Pilatus, Bell, Boeing Business Jets, Embracer, Gulfstream, Textron Aviation, Bombardier – and more.

“Being the can’t-miss event for Business Aviation professionals across Europe, we expect a few new and upcoming aircraft to make their EBACE debuts at this year’s static,” says NBAA Director for Static Displays Joe Hart. “Several pre-owned business aircraft will also be on display for attendees to review and compare.”

Unfortunately, due to ongoing construction at Geneva International Airport, there won’t be pedestrian access to the static display this year. Instead, visitors will have to use a free shuttle service to make the two-minute journey from Palexpo’s Hall 7.

“The EBACE static display undergoes continual refinement as new aircraft are introduced, and we’re excited about our new layout for this year’s display, which we expect attendees will find easier than ever to navigate,” adds Hart.

Backed by BART

As always, BART’s special EBACE Preview Edition is our biggest of the year, with articles covering every aspect of industry, including interiors, training, modifications, light jets, mid-size jets, large cabin and long-range jets, turboprops, engines, MRO, avionics and everything in between.

As the Official EBACE Publication, BART International is committed to providing you the insight and information you need to have a productive – and fun – EBACE experience.

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AERIA is the completions division of VT San Antonio Aerospace, Inc., which is an affiliate of ST Aerospace.
In its latest Global Light Business Jet Market Survey, Research and Markets analysts forecast that the Light Jet market is set to grow at a compound annual growth rate (CAGR) of 5.68% until 2021. But why wait until 2021? Last year deliveries of light business jets were up by 1.3%, with a total of 676 jet being delivered (nine more than in 2016). And across all business-jet categories, it was the Very Light Jet (VLJ) sector that saw the biggest jump in deliveries, increasing by just over 75%. “Looking ahead, we’re optimistic given some very positive economic indicators and stabilization in the used business aircraft market,” says GAMA President and CEO Pete Bunce.

New Kids on the Block
Delivery numbers in this sector were bolstered by the addition of two aircraft types, both of whom have started their initial delivery pushes in recent years. Of these it was the Cirrus SF50 that had the biggest impact on 2017 delivery numbers. Having delivered three aircraft right at the end of 2016, Cirrus continued delivering the initial batch of aircraft to customers throughout 2017, ending the year with a total of 22 deliveries. So far, all the SF50s have been delivered to US customers.

Speaking of Cirrus Aircraft, in 2016 the company received FAA certification of the world’s first single-engine “Personal Jet” – the Vision Jet SF50. The aircraft features a seamless monocoque carbon fuselage sheltering a cabin that can accommodate five adults and two children. Since certification, the company has delivered 25 Vision Jets and claims to have more than 600 orders and options. The company is also targeting charter and fractional operators – a potentially lucrative market, especially in Europe with new rules for CAT-SET-IMC operations.

JetStream, Cirrus’ comprehensive ownership program, includes coverage for the Williams International TAP Blue turbine engine, airframe and avionics maintenance, normal wear item replacement, and premium recurrent pilot training. The Vision Jet’s imaginative “piggyback” engine placement and eye-catching V-tail design is a novel solution for reducing cabin noise. The Cirrus Airframe Parachute System (CAPS) provides the ultimate safety advantage – an exclusive Cirrus technology that has saved over 100 lives in its SR20 and SR22 aircraft.

The second aircraft that helped bump up 2017 delivery numbers is the HondaJet, which continues to be delivered in high numbers. Deliveries began right at the end of 2015, and 2017 deliveries were almost double in 2016. In 2017, Honda Aircraft delivered 43 aircraft to customers in North America, Latin America, Europe and Asia. A highlight of these new deliveries was the handover of the first HondaJet to a customer in Thailand.

As customer demand continues to increase, the company is steadily ramping up production at its 133-plus acre world headquarters in Greensboro, North Carolina. It is currently manufacturing the aircraft at a rate of four per month. Since gaining its type certification from the FAA in late 2015, HondaJet has achieved several milestones, including breaking 13 speed records and opening a new dealer facility in Guangzhou, China. Last February, the company proudly announced the sale of 16 HondaJets to French air taxi company Wijet. The first aircraft was to be delivered in March 2018, with deliveries staged over the next 18 months.
The HondaJet is currently certified in Europe (European Aviation Safety Agency), the United States (Federal Aviation Administration), Mexico (Directorate General of Civil Aviation), Canada (Transport Canada) and Brazil (Brazilian National Civil Aviation Agency).

Another newcomer to the Light Jet category is the Pilatus PC-24, whose customer deliveries started at the very end of last year. For an in-depth look at this program, please see our article on page 40.

Still Phenomenal

Other aircraft, although less recent, remain very active on the light jet market thanks to continued updates. Last year, Embraer Executive Jets celebrated the 10th anniversary of the first flight of its Phenom 100 entry level business jet. Just two years after its December 2008 certification, the company had delivered 199 aircraft, making the Phenom 100 the most delivered business jet in the world. Today, over 350 aircraft are flying in 37 countries. The combined fleet of Phenom 100 and Phenom 300 aircraft is approaching 800 in close to 40 countries. Together, the Phenoms have now reached the one million flight hour mark.

In July 2016, the Phenom 100 EV was introduced. The updated jet features modified Pratt & Whitney Canada PW617F1-E engines, with 1,730 pounds of thrust, reaching a 405 kts high speed cruise and up to 15% more thrust at hot-and-high airports - which equates to more range and a faster time to climb. The aircraft has a four-occupant range of 1,178 nautical miles (2,182 km), with NBAA IFR reserves. Designed for single-pilot operation, its cockpit features the touchscreen-controlled Prodigy Touch flight deck, based on the Garmin G3000, with larger HD displays, split screen capability, and a new weather radar. The first Phenom 100 EV was delivered to a customer in March 2017.

During NBAA 2017, Embraer unveiled the Phenom 300E light jet. Here the “E” stands for “Enhanced” in reference to its entirely redesigned cabin and the addition of nice HD CMS/IFE (Cabin Management System/InFlight Entertainment) by Lufthansa Technik. The Phenom 300E inherits the Embraer DNA Design, first introduced in its larger siblings, the Legacy 450 and Legacy 500 midsize jets. The application of this design in the Phenom 300E rendered a more spacious cabin with more customization options and ease of maintainability. Deliveries commenced in the first quarter of 2018.

Big Numbers from Cessna

Textron Aviation recently celebrated the delivery of the 2,000th aircraft from its Cessna CJ light jet family, a Cessna Citation CJ3+. The company offers a broad range of light jets, from the entry-level Citation M2 jet, to the CJ3+ and the top-performing CJ4. More than 7,000 Citation jets have been delivered to customers around the world, with the total fleet reaching nearly 35 million flight hours.

According to Textron, the single-pilot Citation CJ3+ has the best-in-class acquisition and operating costs, seating for nine passengers, up to 1,000 lbs. of baggage capacity and a maximum range of 2,040 nautical miles. The CJ3+ incorporates G3000 touch-screen avionics and high-speed internet capabilities such as LinxsUs to provide real time diagnostics. When equipped with the Garmin GDL59 (Wi-Fi Datalink) and Garmin GSR56 (Iridium Satellite Receiver), LinxsUs technology works with the Central Diagnostics Maintenance system (CDMS) to monitor the aircraft 100 percent of the time. In the event of an onboard issue, actionable answers are provided in real time, resulting in faster turnaround to get the aircraft back in the air.

Coming Soon

We have not mentioned here the SyberJet SJ30. Originating in the 1980’s, this light jet powered by two Williams FJ44-2A engines and capable of a top speed of 486kts has a max...
The end of 2017 was a decisive time for Pilatus and its PC-24 program. Starting on December 7th, the aircraft received both EASA and FAA certification. Immediately afterwards, the first production aircraft was handed over to US customer PlaneSense – the first of six PC-24s that the company has on order. Specialized in fractional ownership transportation service, PlaneSense currently operates 36 PC-12s. It will take delivery of two more PC-24s in 2018 and three in 2019 (it also wants to order several more as soon as the order book reopens).

The PC-24 development project was officially announced in 2013, but work on the Super Versatile Jet (as Pilatus refers to its new twin-jet) has in fact been in progress for the last 11 and a half years. The first prototype completed its maiden flight in May 2015. All three prototypes used in the certification program flew more than 2,200 hours worldwide. “All performance data promised to our first customers have been achieved or even exceeded,” said Oscar J. Schwenk, chairman at Pilatus following the certification program. “The PC-24 delivers a maximum speed of 440 knots (815 km/h) compared to the contractually agreed 425 knots (787 km/h) – to cite just one example.”

Pilatus has invested over 500 million Swiss francs ($466 million) of its own funds into the PC-24 development program. A further 150 million Swiss francs ($140 million) went into the buildings and state-of-the-art production machinery needed to expand PC-24 series production capacity. Pilatus currently has eight PC-24s on the assembly line, with 23 deliveries to customers around the world planned throughout 2018. In the US – one of the most important markets for the company – Pilatus has invested in a new completions and support center. At its Swiss home-base of Stans, near Lucerne, last year Pilatus built a new 10,000 square meter (107,640 square feet) hangar to provide space for assembly work on 140 aircraft per year.

Reopening of the Order Book
Pilatus closed the PC-24 order book in 2014 after having sold the initial production run of 84 aircraft within just 36 hours. Concerning its reopening, Schwenk told BART that it would probably take place after the company had assessed the feedback from the first operators. As 23 PC-24 deliveries are planned this year, and as several of these aircraft will go to operators who, like PlaneSense, will use them intensively, it is our opinion that the order book will be reopened later this year, most likely during NBAA in Orlando. By this time Pilatus will have delivered some 20 PC-24s and gathered sufficient feedback concerning the behavior of the aircraft. Schwenk admits that there is a waiting list, but he declined to share how many were on that list, only mentioning that his company was planning to produce 4,000 PC-24s throughout its 40-year lifecycle.

Pilot Training
PlaneSense pilots were among the first class to earn type ratings in the PC-24 at FlightSafety International’s Dallas Learning Center, where the first full-motion, Level-D, PC-24 simulator is based. FlightSafety is also the official provider of PC-24 maintenance training, and has been conducting courses with PlaneSense and Authorized Pilatus Service Center personnel as part of an integrated and comprehensive entry into service program.

Air Ambulance
Though the PC-24 will be primarily used for executive and air taxi operations, demand for ambulance aircraft continues to grow. In this respect, the Pilatus twin-jet offers many benefits, including its low operating costs and its ability to operate in and out of short and even unmade runways. There’s also its pressurized cabin, which offers sufficient space and comfort for up to three patients plus medical systems. The aircraft’s large cargo door further ensures easy loading and unloading of stretchers.

Back in 1994, the Australian Royal Flying Doctor Service (RFDS) was amongst the first customers to take delivery of a PC-12, and it currently uses 32 of them. This institution was also among the first to order PC-24s. Other companies will certainly follow the example of the RFDS, and therefore Pilatus is convinced that its new twin-jet will also make its mark in the medical evacuation market.
Many claim originality, but there is always only one true pioneer. In designing the PC-12 our objective was to create the world’s most versatile, high performance, efficient and safe aircraft and back it up with the highest level of service. Today, with over 1,500 aircraft in operation, our commitment is just as strong as when the first PC-12 was delivered. At Pilatus, we succeed by helping our customers succeed. How’s that for an original idea? Step up to the “Pilatus Class” now.
It’s not particularly easy to define midsize jets, as some light jets have more corresponding characteristics to midsize jets, and some midsize jets lean more towards the super-midsize category. For this article, we focus on the absolute, in-production, OEM-designated midsize jets, by which three OEMs are competing actively: Embraer Executive Jets, Bombardier Business Aircraft and Textron Aviation. Lucky for us, each OEM only produces a couple of midsize aircraft, which makes comparisons ever so interesting!

**Learjet 70/75 and the Citation XLS+**

Starting at the lower end of the midsize class of aircraft are those with a range of around 2,000 nautical miles, such as the Bombardier Learjet 70 and 75 and Cessna’s Citation XLS+. The Citation XLS+ is an upgraded version of the original Citation Excel, which was introduced in the early 1990s. Since its first delivery in 1998, 936 units of the Excel, XLS and XLS+ varieties have been delivered. Of the entire fleet, close to 150 are operating in Europe, with Germany and Portugal as the top two countries.

Although the Lears are often designed as light jets with midsize features, their specifications come astonishingly close to those of the Citation XLS+. For instance, range-wise we’re talking about a difference of 60 nautical miles between the Learjet 70 and 75 (2,040 and 2,060, respectively) and the Citation XLS+ (2,100). While the both Learjets are powered by Honeywell’s TFE731-40BR engines, Cessna opted for Pratt & Whitney Canada’s PW545C turbofans.

The differences in passenger capacity, maximum speed and MTOW are also negligible: The Learjet 70 offers seating for up to nine passengers, as does the Citation XLS+, but the Learjet 75 reduces that number to a maximum of seven. Both Lears also feature a maximum speed of Mach 0.81, while the XLS+ only goes as fast as Mach 0.75. MTOW differs no more than 700 lb, between the Learjet’s 21,500 lbs and the XLS+’s 20,200. However, the XLS+ does outclass both Learjets in take-off distance, with a little bit less than 900 feet. Finally, while the Learjet 70 is $1.7 million cheaper than the $13 million Citation XLS+, the Learjet 75 ups it a notch to $13.8 million.

Our verdict: Any frequent business flyer looking for a lighter jet with midsize features can surely find the right fit among these three options.

**Legacy 450 vs the Citation Latitude**

Moving on to the middle of the midsize aircraft category, we find Embraer’s Legacy 450 and Textron Aviation’s overwhelmingly popular Citation Latitude. Both aircraft obtained their relevant type certificates in 2015, marking their entry into service, and have been competing ever since.

Not so surprisingly, their individual specifications are similar on many levels. However, some points of differen-
tiation can easily be found. Take their cabin dimensions, for instance. The Legacy 450 features the largest cross-cabin of its class, at 6 feet and 10 inches wide — even though the Latitude follows closely at 6 feet and 4 inches. Both cabins are identical in height at 6 feet, but the Legacy 450 outranks the Latitude with just over 2 feet in length.

Just like its slightly larger sibling, the Legacy 500, the Legacy 450 is powered by Honeywell’s HTF7500E engines, giving it a 6,540-pound thrust capacity, which sets its maximum speed at 0.83 Mach. The aircraft’s size and MTOW of 35,274 lbs allow for a take-off distance of 3,907 feet. The Latitude, on the other hand, runs on Pratt & Whitney Canada’s PW306D1 turbofans with a 5,907-pound thrust, resulting in a maximum speed of Mach 0.80. Its relatively smaller size and lower MTOW of 30,800 lbs allows it to take off over a significantly shorter distance of 3,580 feet. Even when it comes to range, both aircraft are worthy competitors — the Legacy 450 offers a maximum of 2,904 nautical miles, whereas the Latitude comes in at 2,850.

In short, the Legacy 450 offers a larger cabin, a longer range, higher maximum speed and MTOW, but requires 500 feet more to take-off. Although the Latitude has proved itself to be the most popular aircraft in its class, the Legacy has one other feature that outranks the competition: its price tag. For all the above advantages, the Legacy 450 still costs $1 million less than the $16.25 million Citation Latitude.

Regardless, recent annual delivery reports show that the Citation Latitude claimed the most deliveries for the second time in a row in its segment. Last year, 54 units were delivered worldwide, up with 30% from 2016’s 42 units. According to the company, the aircraft has been certified in 43 countries, and since its entry into service two and a half years ago, 112 units have been delivered, outselling its nearest competitor 4 to 1. To date, only 15 units of the Legacy 450 have been delivered.

Both the Legacy 450 and 500 will be on the static display at EBACE 2018, each of which will be showcasing a number of new features. Embraer introduced several options that have enhanced the aircraft’s performance and passenger comfort, including FANS 1/A+ technology and a reduced maximum cabin altitude.

The FANS 1/A+ technology allows datalink communications between the aircraft’s pilots and the nearest air traffic control. The reduced maximum cabin altitude from 6,000 ft to 5,800 ft — when flying at 45,000 ft — improves passenger and crew comfort, while at the same time increasing passenger fatigue mitigation.

“Extensive customer interaction has generated improved ergonomics through design improvements to the leg rests, lumbar adjustments, heating and massage, and the addition of headrest wings,” says Guy Douglas, Embraer’s EMEA Director of Corporate Communications. “The new seating options also offer customers more personalization options through new styles in stitching, leather material textures and color applications.”
With 56 deliveries, Challenger 350 was the top-selling business jet last year.

**Out-of-Class Close Call**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cabin L</th>
<th>Cabin W</th>
<th>Cabin H</th>
<th>Cabin Volume</th>
<th>Seating</th>
<th>Range</th>
<th>Speed</th>
<th>Take-off distance</th>
<th>MTOW</th>
<th>Engines</th>
<th>Price</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legacy 500</td>
<td>27'6&quot;</td>
<td>6'10&quot;</td>
<td>6'0&quot;</td>
<td>1127.5</td>
<td>Up to 12</td>
<td>3,125 nm</td>
<td>0.83 Mach</td>
<td>4,084 ft</td>
<td>38,360 lb</td>
<td>Honeywell HTF7500E</td>
<td>$19 M</td>
<td>2014</td>
</tr>
<tr>
<td>Citation Sovereign+</td>
<td>25'3&quot;</td>
<td>5'5&quot;</td>
<td>5'7&quot;</td>
<td>763.6 +35</td>
<td>Up to 12</td>
<td>3,200 nm</td>
<td>0.80 Mach</td>
<td>3,530 ft</td>
<td>30,775 lb</td>
<td>PW306D</td>
<td>$17.9 M</td>
<td>2002</td>
</tr>
<tr>
<td>Challenger 350*</td>
<td>25'2&quot;</td>
<td>7'2&quot;</td>
<td>6'0&quot;</td>
<td>1082 +106</td>
<td>Up to 10</td>
<td>3,200 nm</td>
<td>0.83 Mach</td>
<td>4,835 ft</td>
<td>40,600 lb</td>
<td>Honeywell HTF7350</td>
<td>$26.67 M</td>
<td>2013</td>
</tr>
</tbody>
</table>

First things first: The Challenger 350 does come with a substantially higher price tag, at a firm $26.6 million. That’s over $7 million more than the Legacy 500, and close to $9 million more than the Sovereign+. But with the higher price tag come more advantages. For example, the Challenger 350 offers a wider cabin than the Legacy, albeit by just four inches.

While mentioning the Bombardier’s Challenger 350, it wouldn’t kill anyone to also mention Cessna’s Citation X+, the Gulfstream’s G280 or the upcoming Citation Longitude – but these all rightfully belong in the super-mid-size class of aircraft. Their increased range and higher performance in comparison to the above list was a direct result of the 2008 economic blowback where both the light and midsize segments suffered bigger blows in favour of the long-range and large-cabin segment. But all of this just highlights how the lines between one category and another are often blurred – at best.

The new seating options became available to customers receiving aircraft in the second quarter of 2018.

**Legacy 500 vs Citation Sovereign+**

Moving to the far-end of the midsize category of aircraft, the same two OEMs are battling out yet another duel – this time between the Legacy 500 and the Citation Sovereign+. However, while the Legacy 500 outclasses the Citation Sovereign+ on similar levels as the Legacy 450 did with the Citation Latitude, the Sovereign+ does outclass the Legacy 500 in range – albeit by only 75 nautical miles.

The Sovereign+ also maintains its edge on the Legacy 500’s take-off distance, again by a firm 500 feet. What’s more, the Sovereign outprices the Legacy 500, by slightly more than $1 million. Of course, the Sovereign has been in service since 2004, and formed the basis for the Citation Latitude, whereas the Legacy 450 and 500 are clean sheet designs.

According to the company, since its first delivery, to date 423 units of the Sovereign and Sovereign+ models have been delivered, of which close to 40 are currently operating in Europe, with Germany as its market leader.

**Blurred Lines**

Although officially designated as a super-midsize aircraft, Bombardier’s youngest upgrade of its famously popular Challenger 300 series, the Challenger 350, is an out-of-class close call competitor to the Legacy 500 and Citation Sovereign+.
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Global 7000 is the industry’s only aircraft with four living spaces, a permanent crew suite and kitchen.

Although every business aircraft is unique, to simplify things the industry has created several loosely-defined categories of aircraft. The long-range, large-cabin category of business aircraft has been gaining name and fame since the economic downturn of 2008, which hit the light and mid-size categories hard. While those two classes suffered severely in terms of number of deliveries, the long-range, large-cabin aircraft remained resilient. This can be partly explained by the substantial price difference between entry-level, light and mid-size business jets on the one hand and the transcontinental, ultra-long range and luxurious large-cabin business jets on the other.

Although this category is primarily defined by cabin size and total range, aircraft in the long-range, large-cabin category tend to also meet specific minimum requirements for capacity, MTOW, price and runway length. Not surprising, the range of this kind of aircraft is pretty extensive, varying between 5,000 and 7,500 nautical miles. Equally unsurprising are the larger measurements of the cabin, typically starting at a minimum length of 40 to 50 feet, a width between 7 and 9 feet, and a height of 6 feet. The larger the cabin, the more passengers the aircraft can carry – and here we’re talking about between 16 and 20 passengers.

Both the size of the aircraft and the higher capacity have an affect the aircraft’s maximum take-off weight, which usually lies between 70,000 to 100,000 lbs. The size of the aircraft also implies a certain runway length, reducing the number of available airports that these jets can operate to. In the case of long-range, large-cabin air-
Variant Bombardier’s Global family includes Global 5000, 6000, 7000 and 8000 (from top to bottom).

VARIANT Bombardier’s Global family includes Global 5000, 6000, 7000 and 8000 (from top to bottom).

BOMBARDIER

<table>
<thead>
<tr>
<th>Model</th>
<th>Cabin Size (cu ft)</th>
<th>Seating Range</th>
<th>Speed</th>
<th>Take-off distance</th>
<th>MTOW</th>
<th>Engines</th>
<th>Price</th>
<th>Year</th>
<th>Competitor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global 5000</td>
<td>1,884</td>
<td>Up to 16</td>
<td>5,200 nm</td>
<td>0.89 Mach</td>
<td>5,540 ft</td>
<td>92,500 lb</td>
<td>RR R710A2-20</td>
<td>$65 M</td>
<td>2010</td>
</tr>
<tr>
<td>Global 6000</td>
<td>2,002</td>
<td>Up to 17</td>
<td>6,000 nm</td>
<td>0.89 Mach</td>
<td>6,476 ft</td>
<td>99,750 lb</td>
<td>RR BR710A2-20</td>
<td>$60 M</td>
<td>2008</td>
</tr>
<tr>
<td>Global 7000</td>
<td>2,637</td>
<td>Up to 17</td>
<td>7,400 nm</td>
<td>0.925 Mach</td>
<td>5,950 ft</td>
<td>106,250 lb</td>
<td>GE Passport</td>
<td>$58 M</td>
<td>2016</td>
</tr>
<tr>
<td>Global 8000</td>
<td>2,236</td>
<td>Up to 13</td>
<td>7,900 nm</td>
<td>0.925 Mach</td>
<td>5,880 ft</td>
<td>104,800 lb</td>
<td>GE Passport</td>
<td>$58 M</td>
<td>2016</td>
</tr>
</tbody>
</table>

Bombardier’s Global family

- Global 5000
- Global 6000
- Global 7000
- Global 8000

The required runway length lies between 5,250 and 6,500 feet. And of course, with larger jets come higher prices, and these fluctuate between $45 and $65 million per unit.

**Big Cabin Comparison**

When it comes to cabin size, the Bombardier Global 7000 reigns supreme. At 2,637 cubic feet, its cabin size allows for four individual living spaces and a permanent crew rest area. The Canadian OEM announced the Global 7000 during the 2010 NBAA convention and, together with its sibling, the longer-range Global 8000, are extensions of the company’s popular Global 5000 and Global 6000 aircraft. Since the behemoth’s first flight in November of 2016, five test aircraft have successfully joined the testing program and type certification is expected to occur in the first half of this year. Powered by GE’s Passport engine, the Global 7000 uses 16,500 pounds of thrust to take off over a little less than 6,000 ft.

While the production of the Global 7000 is already sold out through 2021, there are increasing doubts about whether or not the Global 8000 will ever spread its wings. No significant orders have been made since 2010.

Meanwhile, the G650, Gulfstream’s flagship, has been in the game since 2008. During EBACE 2014, the Savannah-headquartered OEM announced the Extended Range G650ER. With 2,583 cubic feet of cabin space and an extended range of 7,000 to 7,500 nautical miles, the G650ER is positioned as a direct competitor to the Global 7000. At a
**SIBLINGS**

Clockwise from top left: Gulfstream’s G550, G500, G600, G650ER and G650.

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**GULFSTREAM**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cabin L</th>
<th>Cabin W</th>
<th>Cabin H</th>
<th>Seating</th>
<th>Range</th>
<th>Speed</th>
<th>Take-off</th>
<th>MTOW</th>
<th>Engines</th>
<th>Price</th>
<th>Year</th>
<th>Competitor(s)</th>
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<tbody>
<tr>
<td>G500</td>
<td>41'6”</td>
<td>7'11”</td>
<td>6'4”</td>
<td>1,715</td>
<td>Up to 18</td>
<td>5,200 nm</td>
<td>0.925 Mach</td>
<td>5,400 ft</td>
<td>PW814</td>
<td>$43.5 M</td>
<td>2014</td>
<td>Falcon 5X Global 5000</td>
</tr>
<tr>
<td>G550</td>
<td>43'3”</td>
<td>7'11”</td>
<td>6'2”</td>
<td>1,669</td>
<td>Up to 19</td>
<td>6,750 nm</td>
<td>0.885 Mach</td>
<td>5,910 ft</td>
<td>RR BR700</td>
<td>$43 M</td>
<td>2014</td>
<td>Global 6000</td>
</tr>
<tr>
<td>G600</td>
<td>45'2”</td>
<td>7'11”</td>
<td>6'4”</td>
<td>1,884</td>
<td>Up to 19</td>
<td>6,500 nm</td>
<td>0.925 Mach</td>
<td>5,900 ft</td>
<td>PW815</td>
<td>$54.5 M</td>
<td>2014</td>
<td>Falcon 7X Global 6000</td>
</tr>
<tr>
<td>G650</td>
<td>46’10”</td>
<td>8'6”</td>
<td>6’5”</td>
<td>2,138</td>
<td>Up to 19</td>
<td>7,000 nm</td>
<td>0.925 Mach</td>
<td>5,858 ft</td>
<td>RR BR725</td>
<td>$60 M</td>
<td>2008</td>
<td></td>
</tr>
<tr>
<td>G650 ER</td>
<td>46’10”</td>
<td>8'6”</td>
<td>6’5”</td>
<td>2,138</td>
<td>Up to 19</td>
<td>7,500 nm</td>
<td>0.925 Mach</td>
<td>6,299 ft</td>
<td>RR BR725</td>
<td>$62 M</td>
<td>2014</td>
<td>Global 7000</td>
</tr>
</tbody>
</table>

The Gulfstream G650 has a unit price of $60 to $62 million – depending on the extended range – the G650 beats the Global 7000 on price by about $3 million. While the Global 7000 offers eight feet more cabin length, the G650’s cabin width and height top that of the Global 7000 – albeit by only a couple of inches. Both the G650 and the Global 7000 share a maximum speed of Mach 0.925.
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As the fastest ultra-long-range jet, the G650ER is one of the most coveted aircraft among the global travelling elite. The G650ER will be on the static display at EBACE. According to Gulfstream Corporate Communications and Media Relations Director Heidi Fedak, there are more than 40 G650 and G650ERs operating out of Europe. “Both the G650ER and the G650 continue to provide European customers with the performance standards that keep these aircraft in a class of their own, from their long-range capabilities at high speeds to the four-living-area cabin fully customized to each customer’s mission requirements and design preferences,” she says.

In third place for largest cabin space is the Dassault Falcon 8X, which comes with 2,038.5 cubic feet of room. The Falcon 8X took the flagship crown from the popular 7X during its unveiling in 2016. The Falcon 8X can not only fly 500 nautical miles further than the 7X, but also features the longest cabin of the entire Falcon family at 42 feet and 8 inches. Powered by three Pratt & Whitney Canada PW307D turbofan engines, the $58 million tri-jet requires 6,000 feet to take off and can travel 6,450 nautical miles. The Price Tag Comparison

Cabin size is one thing, budget is another. For example, although the G650 has earned its rightful place among the top three of largest cabin aircraft in the industry, at $60 million, it also comes at a price. Which brings us to Dassault.

Although Dassault had to axe its Falcon 5X program in December of 2017 due to ongoing issues and delays with the development and certification of the Safran Snecma Silvercrest engine, the French OEM did present a new Falcon less than two months later. The Falcon 6X maintains the Falcon 5X’s industry-leading cabin cross-section (8 feet and 6 inches wide and 6 feet and 6 inches high – up an inch over the G650). It also adds an additional two feet of length over what the 5X was offering, not to mention another 300 nautical miles in range to the 5X’s 5,200 nautical miles. Needless to say, the OEM opted out of returning to Safran for the 6X’s engines, instead assigning the task to Pratt & Whitney Canada, who will be delivering two PW812D – the “D” stands for Dassault – turbofans to power the aircraft.

At $47 million, anyone who doesn’t necessarily need the G650’s 7,000 nautical mile range but does require a large cabin, the upcoming Falcon 6X might be the perfect fit.

A more direct competitor to the Falcon 6X – considering the huge difference in range and resulting price with the G650 – is Gulfstream’s latest addition, the G500. Admittedly, with 128 cubic feet less cabin space, the Falcon 6X does outmatch the G500 on that level (even if the G500 has 1 foot and two inches more cabin length). However, the G500’s maximum speed – Mach 0.925 – outclasses the Falcon 6X’s Mach 0.90. What’s more, aside from practically equal MTOW and take-off distances, the G500’s 2017 list price stands at $3.5 million less than the Falcon 6X.

“The all-new Gulfstream G500 will also land in Geneva on the tailwinds of a 12-country world tour that began in January to give customers a first-hand experience of the air-
The Falcon 6X (bottom left). The Falcon 7X (bottom right).

DASSAULT

<table>
<thead>
<tr>
<th>Model</th>
<th>L (ft)</th>
<th>W (ft)</th>
<th>H (ft)</th>
<th>Cabin Size (cu ft)</th>
<th>Seating</th>
<th>Range</th>
<th>Speed</th>
<th>Take-off distance</th>
<th>MTOW (lb)</th>
<th>Engines</th>
<th>Price (M)</th>
<th>Year</th>
<th>Competitor(s)</th>
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<tr>
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<td>40'4&quot;</td>
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<td>6'6&quot;</td>
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<td>5,500 nm</td>
<td>0.90 Mach</td>
<td>5,480 ft</td>
<td>77,460</td>
<td>PW812D</td>
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<td>6'2&quot;</td>
<td>1,552</td>
<td>Up to 16</td>
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<td>G600</td>
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The new-generation models of Falcon 6X (top, center). The Falcon 8X (bottom left). The Falcon 7X (bottom right).

craft’s vast capabilities and design excellence,” says Fedak. These capabilities include an increased range over the G500’s originally announced range — the aircraft can fly 5,200 nautical miles at its long-range cruise speed of Mach 0.85, and at its high-speed cruise of Mach 0.90, the G500 has 4,400 nautical mile range.

“As the G500 prepares to enter service this year, European customers are among those who have shown an ardent interest in the aircraft, as well as its sister ship, the Gulfstream G600,” adds Fedak.
The Citation Hemisphere

Returning for a moment to cabin size, another recent and relevant addition to the long-range, large cabin segment is Textron Aviation’s Citation Hemisphere. Although the aircraft’s 4,500 nautical mile range lags its closest competitors (1,000 nautical miles less than the Falcon 6X, and 700 less than the G500 and the Global 5000) the aircraft does compete well when it comes to cabin size. It boasts three feet more in length, features the same width as the Falcon 6X – and the widest of all Citations – and differs only inches in height.

With an estimated price ticket of between $30 and $35 million, the Citation Hemisphere could become a close competitor for the Falcon 6X, especially considering its projected earlier timeline. Textron Aviation plans to achieve first flight in 2019, with entry into service following the next year. In comparison, first deliveries of the Falcon 6X are expected to occur in 2022, giving the Hemisphere a two-year head start.

A noteworthy countering element, however, is Textron Aviation’s choice of the same Snecma Silvercrest engines that caused the Falcon 5X’s demise. Dassault’s initial argument for opting for Safran was the Silvercrest’s best-in-class fuel efficiency potential. If fully operational, it could save up to 15% in fuel consumption compared to its closest competitor. When Dassault announced the cancellation of the Falcon 5X, Textron did issue a statement expressing its full confidence that Safran would be able to resolve the problem before the Hemisphere’s projected first flight.

Solid Foundation, Robust Pipeline

All things considered, there are a lot of recent players that are entering the long-range, large cabin field – Gulfstream G500 and G600, Bombardier’s Global 7000 (and perhaps Global 8000), Dassault’s Falcon 8X and upcoming Falcon 6X, and the newest member of the team, the Citation Hemisphere. But what about the veterans still on active duty? Let’s not forget that the last G450 – due to be replaced by the G500 – was delivered in January of this year. Still in production aircraft such as Bombardier’s Global 5000 and 6000, Gulfstream’s G550 and Dassault’s Falcon 7X have proved to be tremendously popular over the last 15 years, and deliveries haven’t stopped.

“The G550 continues to see customer demand in Europe thanks to its long-standing reputation as the leader in its segment,” says Fedak. “The aircraft’s reliability, technologically advanced flight deck and cabin comfort offers a great value for European customers. Overall, Gulfstream’s fleet in Europe increased by 15 percent between 2013 and 2017.”

With a solid foundation of veteran players and a robust pipeline of new entrants, expect the long-range, large-cabin category to be the driving force for Business Aviation in the years to come.
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A GOOD TIME TO BE A TURBOPROP

While turboprop airplanes already in the field are well-utilized, a slight dip in new production deliveries was noted in the 2017 numbers issued by the General Aviation Manufacturers Association (GAMA) in late February. A total of 563 new turboprops were delivered in 2017, versus 582 in 2016 – a 3.3% drop, but still above 2015 deliveries. Some 90 of the delivered turboprops were multi-engine airplanes, while 475 were single engine turboprop (SETP). Of the latter, 176 were for agricultural applications.

That being said, the turboprop Business Aviation segment seems to be poised for growth in the coming year or two, owing to new-product developments and interest shown in now-legal commercial IFR operations by single-engine turboprops in Europe. EASA issued new regulations allowing CAT SET flights in March 2017, joining most other governing bodies that already allow customers to hire single-engine turboprops.

As Textron Aviation’s Cessna division prepares to introduce two new turbo-propeller airplanes, and Epic Aircraft nears certification of its E1000 turboprop, the marketplace will assuredly shift to make room for these new players. At the same time, competing OEMs are enhancing their products, taking them to a new level of utility, performance and comfort.

Beechcraft King Airs

When one thinks of turboprop business airplanes, the iconic Beechcraft King Airs are certainly at the top of the list. For over 50 years, the King Airs have dominated the twin turboprop field, despite competition from Cessna, Commander, Mitsubishi, Piaggio, Piper and Swearingen – even shrugging off sibling rivalry from the upstart Beech Starship.

Now a division of Textron Aviation, Beechcraft has persevered by offering a full line of complimenting products, from the four/five place cabin of the C90GTx to the T-tail extended-cabin King Air 250 and the even-larger heavyweight King Air 350i. Supplied for military and government agency multi-mission and extended-range roles, as well as medical evacuation and combo passenger/cargo functions, there’s a King Air for every purpose. Australia’s Royal Flying Doctor Service has long utilized King Airs for its operations and recently ordered two heavyweight-option King Air 350’s to supplement its fleet.

It’s a good time to be a turboprop. Business airplanes with propellers, powered by dependable turboprop powerplants, are working steadily every day, doing their jobs with a unique combination of economy, ease of operation and performance. With some advanced turboprop aircraft designs looming on the horizon, LeRoy Cook says this segment of the industry is destined for continued success.
Cessna Turboprop

In 1985, Cessna filled a void in the marketplace with the introduction of its big utility single-engine Caravan 208. Now in ubiquitous worldwide service, the Caravan series is available as the basic short-cabin Caravan, equipped with a 675-shp PT6A-114 engine, and the longer Grand Caravan EX with the more-powerful 867-shp Pratt & Whitney PT6A-140 engine. Supreme versatility, the Caravans can be fitted with a belly-mounted cargo pod, amphibious floats, skis and skydiving kits.

Given an initial impetus by a fortuitous relationship with the FedEx Corporation, cargo-only versions of the Caravan have been flying almost from the type’s inception. In furtherance of this role, Textron Aviation is developing a twin-engine, unpressurized, fixed-gear, high-wing turboprop called the SkyCourier 208. The aircraft is specifically designed to give FedEx a larger feeder-route airplane. The SkyCourier, which is targeted for a 2020 introduction, will be equipped with 1,100 shp P&W PT6A-65SC engines and a Garmin G3000 avionics suite. Performance targets include a 200-knot cruise speed and a 400 n.mi. range with a 5,000-lb. payload.

Even before the SkyCourier’s concept illustrations appeared last year, Textron was well on the way with its larger pressurized business-class single-engine retractable-gear turboprop: the Cessna Denali. Projected to cruise at 285 knots and range out to 1,600 n.m.i. with four passengers, it will be certified to carry up to 11. Expected to fly in Q4 2018, the Denali will use a 1,240-shp General Electric advanced turboprop rather than the otherwise-dominant P&W single offers a slightly smaller, more nimble option to the Cessna Caravan. Introduced in 2009 as a humanitarian aid back-country load hauler, the Kodiak has taken on wider responsibilities with executive interiors, floats, a cargo pod and large tires for bush operation. A large loading door enables flexible utility roles. The Kodiak 100 is fitted with a 750-shp PT6A-34 engine, using dual exhausts.

Piper Aircraft

By comparison to the larger, more-costly singles, Piper Aircraft offers its M-Class pressurized single-engine turboprops as executive aircraft, often flown by the owner. With the 2016 introduction of the M600, as a follow-on to the former PA-46-500TP Meridian, the Piper flagship became a much more capable six-seat business plane. The aircraft features an entirely-new wing design that provides enhanced payload, speed and range over the still-produced M500 predecessor. Additional avionics enhancement from the Garmin G3000 flight deck also separates the 600-shp PT6A-42A powered M600 from the M500’s G1000 NXi avionics and 500-shp PT6A engine.

Daher Socata

Starting in 1991, Daher led the single-engine turboprop revolution with 65SC engines and a Garmin G3000 avionics suite. Performance targets include a 200-knot cruise speed and a 400 n.mi. range with a 5,000-lb. payload.

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heated seats at every seating position, selectable to three settings. In addition, backlighting has been added to the central console and a high-fidelity microphone is now incorporated into the pilot's oxygen mask. A quickly-enclosed private lavatory was introduced in 2016.

**Pilatus**

Pilatus Aircraft remains the dominant purveyor of executive turboprop singles, with its PC-12 now marking over 1,500 deliveries. While much attention has been focused on the introduction of Pilatus' PC-24 Super Versatile Jet, the PC-12 NG has by no means been forgotten. Enhancements continue with the latest iteration of the PC-12, now dubbed “The World’s Greatest Single”. The NG’s cruise speed was increased by five knots with the latest updates, and maximum range is now 1,845 n.m.i. The expansive cabin seats up to nine, and cargo is easily accommodated with the large power-actuated aft door. The big 4,740 kg PC-12 NG is easily propelled by a PT6A-67P flat-rated at 1,200 shp.

**Piaggio Aerospace**

The Piaggio Avanti EVO twin turboprop continues to compete not just with other business-class turboprops, but also with light jets. Its capability is more akin to jet aircraft, with a 402-knot maximum speed and a 41,000-foot maximum operating altitude. Now available with an extended-range option, it can reach 1,720 n.m.i. at best-range speed. The Avanti EVO’s unique three-lifting-surface design allows it to have a jet-like cabin with engine and propeller noise aft of the living quarters, and its 69-inch cabin height is equivalent to much larger aircraft.

The EVO improvement package, announced in 2014, included new winglets, five-blade scimitar propellers, redesigned exhausts, digital nose gear steering, anti-skid brakes and interior refinements. The new propellers turn at 1,800 rpm instead of the previous 2,000 rpm, reducing external noise by 68% and interior noise by roughly 20%.

**Epic Aircraft**

Epic Aircraft is continuing the development of its Epic E1000 carbon-fiber construction pressurized single-engine turboprop, with a second flight test aircraft having joined the certification effort in January. Certification is now targeted for Q3 of 2018. Thanks to certification to a 34,000 foot altitude, the E1000’s anticipated performance includes a 325-knot maximum speed, a max range of 1,650 n.m.i., and a fuel burn of 45 gph. Epic is using a P&W PT6A-67A engine for its E1000, flat rated to 1,200 shp. A three-screen Garmin G1000NXi avionics suite.

**Encouraging Signs**

Based on this overview, the potential for continued robust sales and utilization of turboprop business aircraft continues to be encouraging. With operating economics and versatility on their side – it’s certainly a good time to be a turboprop.
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Unless you have been hiding under a stone for the last two years you can’t fail to have noticed that we have upcoming FAA and European mandates on the use of ADS-B. But it seems that not everyone has got the message.

Steve Nichols reports
The worry is that if operators don’t start to get to grips with ADS-B now, they could miss out. The FAA says that by January 1, 2020, you must be equipped with ADS-B Out to fly in most controlled airspace in the US. The European mandate for ADS-B says all IFR aircraft with a MTOW of 5700 kg (12,655 lbs.) or greater and/or maximum cruising TAS greater than 250 kts must have ADS-B out from June 6, 2020.

But Bill Stone, Garmin’s senior business development manager, said that people are dragging their heels about getting their aircraft equipped with ADS-B Out.

“I would say that the figures are rather underwhelming,” Stone said. “From a bizjet and rotorcraft perspective I would say it looks like only about 15-20% of fleets have either upgraded their aircraft or have booked them into a shop for the work to be done. I guess it is just human nature – people leave everything to the last minute. The problem is that we hear some avionics shops and MROs are now fully booked up for the next six months and some are fully booked up until the end of the year. If people leave it too much longer they won’t be able to get the work done in time – and they’ll be excluded from some airspace as a result,” Stone said.

He added that the take up for ADS-B Out is actually higher for general aviation/piston-engine aircraft.

“I would say that was running at about 35-40%. Around 70-80% of the orders we are seeing include ADS-B In,” Stone said. “Pilots appreciate the extra traffic and meteorological information that they can get onto the aircraft, whether they have compatible integrated cockpit avionics or not. Being able to get ADS-B In information wirelessly onto an iPad app in the cockpit is a big bonus. When customers are having their aircraft in the shop for other work they want to capitalize on the extra capabilities that ADS-B In can give them.”

He said new production aircraft are in good shape, but it is really the ADS-B retrofit market that is dragging its heels.

Stone added that ADS-B is a much harder sell in Europe as there is no ADS-B In functionality and it is harder to justify the expenditure.

In terms of other avionics, Stone said that interest in performance-based navigation is becoming larger in aerospace around the world.

“Although there are no specific mandates in place around the world for performance-based navigation, tools like Wide Area Augmentation Systems (WAAS) in the US, the European Geostationary Navigation Overlay Service (EGNOS) in Europe) and similar systems around the world will become more and more prevalent and will offer more and benefit,” Stone said.

Director of Sales at Universal Avionics Robert Clare said that the company had been incredibly busy supplying ADS-B equipment and broke its targets for 2017.

“With the number of aircraft flying, I think everyone thought it would be impossible to get everyone ADS-B compliant,” he said.

“Panic may be too strong a word, but this year we have seen a lot of operators put in last-minute orders for ADS-B out equipment. We have struggled to meet demand to supply products, but we have really stepped up our manufacturing.

“That’s really great from a sales perspective, but it was challenge last year to keep up. A lot of operators are now looking and the time-line and saying, heck, we need to do something!” Clare said.

“I think a lot of operators will miss out – a lot think the FAA will push the mandate back or give us more time, but so far they are not doing that.”

He said ADS-B In is little more complex as there are two elements – Traffic Information System-Broadcast (TIS-B) and Flight Information System-Broadcast (FIS-B).

“Below 10,000 feet you can get the TIS-B information, which is free but advisory only,” Clare said. “That is fairly easy to install on smaller aircraft, but on larger platforms you need a display, plus the receivers and a lot of avionics manufacturers, including us, are working on getting that capability in future, but we don’t have it right now. Go up to the Part 25 world and the ADS-B In capability is less common – more like 10 per cent of the market.”

Clare also said that operators should be looking further ahead when it comes to purchasing avionics.

“The avionics world is changing really quickly and while the focus has been on the upcoming mandate
there is so much more that they could be taking advantage of," he said.

“One feature that has been around for a while that many operators have not upgraded to take advantage of is LPV – Localizer Performance with Vertical Guidance.” These are the highest precision GPS (WAAS-enabled) aviation instrument approach procedures currently available without specialized aircrew training requirements, such as required navigation performance (RNP).

“To me there are more and more places you can’t fly into unless you have LPV capability – the next big push for Europe is also going to be LPV. You need a TSO-C146 compliant Flight Management System (FMS) to get ADS-B out anyway. In our opinion you can spend a little more money up front to get LPV.

“And the top of that you will also be equipped to be prepared for the Performance-Based Navigation (PBN) requirements that are here today, with all these new advanced approaches that you can fly with certain types of aircraft,” Clare said.

Rob Myhlhousen, principal marketing manager, Rockwell Collins’ Commercial Systems Group, said there had been pretty good uptake with ADS-B over the last 12 months, but there is still a lot to be done.

“Those who risk waiting are going to be on the losing side of the supply and demand curve with the potential for higher pricing as the demand continues to increase,” Myhlhousen said.

“There is the potential for some operators to be non-compliant by the time the mandates kick in.”

In terms of whether people are opting for ADS-B In Myhlhousen said there had been interest from the turboprop and light jet markets.

“We have a lot of aircraft fitted with TCAS so they already have a traffic picture. And when you look at our Proline 21 and Proline Fusion customers, many of them already have XM weather or global data-linked weather, so they are getting some of the services that could come via ADS-In in other ways," he said. “It is something we continue to evaluate, but our focus is on getting people equipped with ADS-B Out.”

Myhlhousen said Rockwell Collins was also concentrating on Performance Based Navigation.

“The FMS is becoming more of a critical piece of the flight deck with PBN. While not mandated today those customers who don’t have capabilities such as RNP and LPV might see some limitations in not getting the prime access to airspace they want. We have airspace modernization upgrade packages for Proline 21 on King Airs, Hawkers and Beechcraft Premiers that can bring these capabilities. We’re also bringing in synthetic vision to the primary flights display (PFD),” he said.

“This ticks the box for the ADS-B Out mandate, but then positions them for PBN in the future. We’re moving to a ‘best equipped, best served’ philosophy, so those aircraft that are equipped will see better access to airspace.”

He said aircraft equipped with a FANS1/A capability are reporting they get faster departure clearance information via controller–pilot data link communications (CPDLC) from the 57 airports in the USA that are so equipped.

“We just urge customers looking at their upgrade choices to look beyond meeting the 2020 ADS-B mandates. Look at how you can take advantage of future airspace modernization activities, including performance-based navigation, and keeping your aircraft relevant for the future. “We also encourage them to research the solutions available for their aircraft. Talk to your dealers, talk to your OEM service providers, understand what options are available and get your upgrade shop time booked in,” Myhlhousen concluded.

Rockwell Collins has a webpage where you can check for upgrade options – see www.rockwellcollins.com/ads-b. Or you can email questions to ads-b@rockwellcollins.com.
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WHAT IS ADS-B?

WHAT EXACTLY IS ADS-B and what benefits does it bring? The acronym ADS-B stands for Automatic Dependent Surveillance – Broadcast, which on its own is pretty meaningless.

ADS-B is “automatic” because it requires neither pilot nor other inputs. It is “dependent” because it depends on data from the aircraft’s navigation system.

Pioneered originally in the US, an ADS-B-equipped aircraft finds its own position using a global navigation satellite system (GNSS), typically GPS, and periodically broadcasts this position and other information to ground stations and other aircraft equipped with ADS-B.

ADS-B-equipped aircraft broadcast their precise position in space via a digital datalink along with other data, including groundspeed, altitude, and whether the aircraft is climbing, or descending. This broadcast capability is sometimes known as a “squitter”.

ADS-B receivers that are integrated into the air traffic control system or installed aboard other aircraft provide users with an accurate depiction of real-time aviation traffic, both in the air and on the ground – although this does require additional equipment to be installed on the aircraft.

Unlike conventional radar, ADS-B works at low altitudes and on the ground so that it can be used to monitor traffic on the taxiways and runways of an airport. It’s also effective in remote areas or in mountainous terrain where there is no radar coverage, or where coverage is limited.

One of the greatest benefits of ADS-B is its ability to provide the same real-time information to both pilots in aircraft cockpits and ground controllers, so that, for the first time, ADS-B equipped aircraft can both “see” the same data, as long as all aircraft in the vicinity are similarly equipped.

To ensure that the system is as compatible as possible with both older and newer technologies ADS-B can be used over several different data link technologies, including Mode-S and 1090MHz data link (in Europe).

The great thing about ADS-B is its automatic nature – the pilot concentrates on flying the aircraft and the system merrily transmits his position without any mechanical intervention. It also benefits from its relative low cost when compared to other surveillance systems, such as radar, its high accuracy, and the fact that it can also support other airborne surveillance applications, which will enable many future updates.

The FAA says ADS-B gives air traffic controllers a more accurate picture of all the aircraft in their airspace and works where radar often doesn’t, even in remote or mountainous areas. With a better view of the traffic they are managing, controllers can eliminate wasted space between aircraft, which increases airspace capacity and decreases the need for holding patterns.

With ADS-B, pilots and controllers see highly-accurate traffic images. These images update in real time and don’t degrade with distance or terrain. Pilots with access to this information can safely fly closer to other aircraft, and they’ll need less assistance from air traffic controllers.

The safety benefits of ADS-B are huge and include improved visual acquisition, especially for general aviation under visual flight rules (VFR) and reduced runway incursions.

In the US, ADS-B equipment can also support Traffic Information Services -Broadcast (TIS-B), whereby details of all traffic known to an ATC system can be transmitted back to suitably-equipped aircraft.

ADS-B Out transmits GPS-based position and other aircraft or vehicle information and implementation is now mandated in 2020. ADS-B In allows transmitted signals to be received by other aircraft as well as ground stations, but this is not part of the 2020 mandate.

There is no mandate for ADS-B “In.” However, this optional “In” capability – which receives the tracking data for display in the cockpit – should be a popular upgrade, since it can clearly enhance situational awareness by giving pilots a view of the same basic traffic data that ground controllers are monitoring on their scopes.

Additional in the US, FAA inducements for adding ADS-B “In” include free datalink weather and various other flight information services.
PUREPOWER® PW800 ENGINE

Setting new standards in performance, fuel efficiency and availability. Exceeding the benchmark for fast, long-range business jet travel.

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In March, GE Aviation officially christened its new Advanced Turboprop (ATP) engine “Catalyst” to reflect its commitment to innovation. The engine has been selected to power Cessna’s new Denali single engine turboprop. According to GE, the new engine enables better performance through proven technology, simplifies the flying experience by reducing pilot workload and creates a higher standard of personalized service and support through digital tools and applications. "The GE Catalyst engine is redefining what a turboprop can do for pilots, airframers and operators in Business and General Aviation," said Paul Corkery, general manager for GE Aviation Turboprops. “It acts as a catalyst in an industry segment that has seen very little technology infusion in decades.”

The Catalyst is the first all-new, clean-sheet engine in more than 30 years in the BGA market and there are currently 98 patented technologies on the engine. It utilizes proven technologies from GE’s larger commercial engines and it incorporates new manufacturing techniques like 3D printing to enable more advanced component designs and reduced part counts. A total of 855 conventionally manufactured parts has been reduced to 12 additive parts. This reduction in complexity speeds production, reduces fuel burn and weight and increases durability with fewer seams and tighter tolerances. Additive components reduce the ATP’s weight by 5% while contributing a 1% improvement in specific fuel consumption (SFC).

The Catalyst is also the first turboprop engine in its class to introduce two stages of variable stator vanes and cooled high-pressure turbine blades and it performs at a 16:1 overall pressure ratio, enabling the engine to achieve as much as 20% lower fuel burn and 10% higher cruise power compared to other engines in the same 1,000-1,600 shp size class and it has a 4,000 hour recommended TBO.

GE is using the Catalyst to introduce the first Full Authority Digital Engine and Propeller Control (FADEPC) for the BGA turboprop market, alternative to traditional turboprop hydro-mechanical, multiple-lever control systems. GE Aviation leveraged its expertise in integration and controls on the engine to develop a single-lever control that offers a "jet-like experience" to reduce pilot workload and maximize performance without exceeding the engine’s limitations. The FADEPC includes an automatic auto-start function and enhanced integrated functions. The Catalyst’s fully integrated digital control system will open up new frontiers of real-time maintenance data collection for turboprops. It collects performance data during each flight and can determine what environment the Catalyst is flying in, the health of the engine during the flight, as well as the health of the controls and accessories.

The cloud-based data is transmitted and collected to create a virtual simulation – or a "digital twin" – of every Catalyst engine that enters service. With this data, operators can add weather, flight and fleet data to compare actual versus expected performance of the engine. GE Aviation can
send alerts specific to engine serial numbers. No other civilian turboprop is currently using a digital twin for preventative health maintenance; however, GE Aviation is already using the digital twin on its commercial and military technology.

To date, GE has invested $400 million in the engine’s development and has finalized an agreement with the Czech government to build its new turboprop headquarters for development, test and engine-production in the Czech Republic. Engineers ran the Catalyst for the first time on Dec. 22, 2017. Certification tests will take place over the next two years, with entry into service targeted for 2020.

GE Aviation’s Passport engine integrated propulsion system received FAA certification in 2016 and is slated to enter service later this year on the Bombardier Global 7000 large cabin, long range business aircraft. The Passport is built on technologies proven and refined on multiple GE programs. The engine surpasses the Committee on Aviation Environmental Protection (CAEP) Tier 6 emissions standards, meets the Federal Aviation Administration’s Stage 4 noise regulations. The Passport includes a high performance core similar to that on the LEAP engine (developed by CFM International, the 50/50 joint company between GE and Safran Aircraft Engines) derived from the eCore program, materials and design conditions similar to the GE90 and GEnx engines, low emission technology from the GP7000 and advanced technology such as the blisk and composites from military engines. In 2013, GE announced agreements with IHI of Japan and Techspace Aero (Safran) of Belgium to become joint venture partners on GE’s Passport. IHI and Techspace Aero are responsible for more than 37% of the Passport engine. Headquartered in Tokyo, Japan, IHI is responsible for the low-pressure turbine module, aerodynamic systems, fan hub frame and aft fan case (30% of the Passport program). Techspace Aero, located in Liège, Belgium, is responsible for the booster module, lube tank and pump and the heat exchangers (7% of the Passport program).

**Pratt & Whitney Canada (P&WC)** bolstered its PW800 customer list in late February when it announced that the PurePower engine had been selected for the Dassault 6X business jet. The PW812D is expected to yield thrust of 13,000 to 14,000 lbs and using the same core technology as the company’s family of geared turbobfans on commercial aircraft that have amassed more than 585,000 hours in service. The PurePower PW800 engine incorporates the latest generation of technologies: delivering double-digit improvement in fuel efficiency, setting a new “green” engine standard for emissions with the advanced TALON X combustor, and its low-noise design and low vibration levels will result in an exceptionally quiet cabin, enabling a more comfortable passenger experience, according to P&WC. PW800 series engines also are flying on the new Gulfstream G500 and G600 aircraft. Last year, P&WC confirmed that it was working on a 2,000 shp variant of its PT6 turboprop engine designed to work with single lever controls that could be fitted onto an aircraft such as a larger version of the Pilatus PC-12 or a new model King Air.

P&WC is also making gains on the service side of the house: At this year’s Heli-Expo, it announced a comprehensive service agreement with Air Medical Group Holdings (AMGH) to provide a comprehensive Engine Services Agreement that will cover approximately 240 P&WC engines flown by the Dallas, Texas-based, medical service provider, through its subsidiaries, Med-Trans Corporation, REACH Air Medical Services, AirMed International and Guardian Flight. AMGH, one of the largest air medical transport providers in the US, provides emergency medical services (EMS) using a mix of helicopters, aircraft and ground ambulances. In addition to Fleet Management Program (FMP) coverage that encompasses AMGH’s fleet of 100 PW206B engines, the new 10-year Engine Services Agreement will also provide fixed overhaul and hot section inspection costs for its fleet of 140 PT6A engines and a host of P&WCSMART programs that also offer guaranteed parts and genuine P&WC parts and labor. “AMGH has had engine maintenance agreements with P&WC for many years and this umbrella Engine Services Agreement will cover helicopter engines already maintained by P&WC in addition to a large number of turboprop engines which were previously not covered,” said Fred Buttrel, chief executive officer of AMGH. “We selected P&WC for this agreement because of our previous experience with it and because we wanted to establish fixed engine maintenance prices up front, reduce risks and improve the overall reliability of the fleet."

Momentum is continuing to build for Honeywell Aerospace’s HTS900 turboshaft after its selection for XTI’s TriFan 600 VTOL, Kopter’s SKYe SH09 utility helicopter and Eagle Copter’s Bell 407 retrofit program. The 820 shp HTS900 is designed to improve the overall reliability of the fleet.”
Honeywell has increased the inspection interval on its LTS101-850B-2 turboshaft engines used in MBB/Kawasaki (Eurocopter) BK 117-850D2 high-performance multirole helicopters from 1,800 flight hours to 2,400 under a plan approved by the FAA. The costs of the inspections will not change. More than 440 BK 117s were built before production ended in 2004. The expanded inspection interval currently applies to the BK 117D, an upgraded variant featuring twin Honeywell LTS101-850B-2 engines, which offer improved performance and higher safety margins over BK 117s equipped with earlier LTS101 variants. More than 55 out of the approximately 180 earlier BK 117 B models were converted to D models with the uprated engines according to Honeywell.

Honeywell has made significant gains with its APU service business year to date announcing several major deals. Working with Logix Aero will see Honeywell deliver its 331-350 APUs to operators without a direct repair contract for the first time. Customers can choose to rent over a period that addresses their business and operational needs, whether on a short-term basis to cover maintenance time on existing equipment, or over a longer term. APUs are flown by the operators during the loan period and returned to Logix Aero when it ends. In February, Honeywell signed the largest-ever APU contract in Asia Pacific in terms of fleet size with Lion Air Group, Southeast Asia’s largest airline group. Honeywell will supply the units and corresponding spare parts for the airline group’s fleet of Airbus A320ceo and A320neo aircraft in addition to spares for Lion Air Group’s Boeing 737NG and Boeing 737 MAX fleet. The agreement covers 620 aircraft over 17 years. Honeywell is the world’s largest manufacturer of APUs, which are found on many leading aircraft, including regional, executive, commercial and military platforms. Meanwhile, Honeywell’s Maintenance Service Plan (MSP) continues to support approximately 75% of Business Aviation aircraft equipped with Honeywell engines or APUs, including the HTF7500E turbofan engine and 36-150 APU for the Legacy 450. The service plan is the most comprehensive on the market and supports over 80 aircraft platforms in more than 100 countries around the world. Rolls-Royce is continuing work on its Advance2 family of business jet engines expected as a follow-on to its 700 series. The Advance2 models are expected to become available around 2020 and feature a slightly larger fan diameter, thrust in the 10,000 to 20,000 lb range, and an increased fuel efficiency of at least 10%.

Company CEO Warren East predicted that this year will be “one of significant operational progress” in which the company would “further reduce cash deficits on engine sales” on the civil side of the house while working with customers to address the in-service engine issues we are currently experiencing, the estimated costs of which are significant.” East said the problems related to “an increased level of activity” managing in-service engine issues on lower than expected durability of a small number of parts for the Trent 1000 and the Trent 900 engines.

“These issues have required urgent short-term support including both on-wing and shop visit intervention which has resulted in increased disruption for some of our customers. This has been a dynamic situation. We have continued to progress our understanding of both the technical and operational issues and we are making solid progress with longer-term solutions, largely through re-designing affected parts. These are expected to be fully embodied in the Trent 1000 fleet by 2022. On the Trent 900, an extended life turbine blade is already being rolled-out into the current fleet with further re-designs underway which will be available in 2020,” he said.

He said that overall the company’s large engine fleet would continue to grow, with over 4,400 engines in active service at the end of 2017, up 7%, on 2016, and invoiced flying hours increased by 12% compared with growth of 4% in 2016. Much of the growth will come from the Trent XWB-84, the engine designed for the Airbus A350XWB-900. “This engine now represents 6% of our in-service widebody fleet and has achieved over 1.2 million flying hours with unparalleled levels of reliability. It is expected that the Trent XWB-84 fleet will grow to around 1,000 engines over the next five years,” East said.
What are the most precious things in your life? Your family, your friends, your business? Whatever they are, the most precious resource that links them all together is time. That's why CorporateCare® offers our customers the industry’s most comprehensive global service network and leading edge digital tools, all focused on getting you to your destination as planned. It’s time to protect your most precious resource. It’s time to consider CorporateCare®. For more information, email corporate.care@rolls-royce.com.

The future. Rolls-Royce.
As everyone knows, EBACE is the prime-time event for Business Aviation in Europe. Sure, the OEMs, MROs and FBOs tend to stand out. But any regular attendee knows that EBACE is about more than just abbreviations – it’s also about what happens on the inside of the latest business jets. Here, an important role is set aside for the cabin interior service providers, who stand at the forefront of making the inside of your business aircraft as sleek and elegant as the outside.

Of course, it’s the OEMs that offer the first range of interior options when you acquire a new business aircraft. Luckily for the picky flyer, there are many specialized companies that offer tailor-made solutions for customizing your aircraft from nose to tail, a number of which we highlight here.

Jet Aviation
Many of the well-known players in the interiors sector are one-stop-shops that provide all the services a business aircraft requires in-house. For example, along with offering FBOs, maintenance, flight services, charter and staffing, Jet Aviation also does completions. Late last year the company officially broke ground on a new 8,700 square-meter wide-body hangar project in Basel, Switzerland. The new hangar, which is scheduled to go into operation at the end of 2018, is suitable for wide-body projects up to a Boeing 747 and is being built specifically to meet increasing demand for wide-body completions and refurbishments.

The hangar will provide an additional 4,500 square meters of hangar space to accommodate a number of wide- and narrow-body aircraft simultaneously. The project also extends the tarmac by 5,000 square meters, while adding 2,000 square meters for shops and offices.

Flying Colours
Canada-based Flying Colours was founded nearly 30 years ago by John Gillespie. Today, John’s two sons, Eric and Sean Gillespie, help run the company, which specializes in – among other services – green completions, refurbishments and executive conversions.

Although the company receives a lot of requests for cabin elements made from (exotic) wood, carbon fiber and fine leather, it has noted a growing trend that relates to the entire cabin. “There’s a trend for cabins to be ‘zoned’, with each section delivering a different functionality,” explains Sean. “As interior designers, this means we need to consider each cabin as a different project while, at the same time, make sure the aircraft’s overall look and feel remains continuous.”
A lot of inspiration and requests from business aircraft owners originate from the automotive and hospitality sectors, which have an interesting impact on aircraft interiors. “We notice that the popular zen-lines have transferred into cabin designs,” says Sean. “As the average age of a business jet traveler continues to become younger, this is likely to create other demands on board to accommodate a younger lifestyle.”

Recent news saw the company’s St. Louis, Missouri, location expand its footprint and capacity six-fold. According to Sean, it’s the first full infrastructure development since the company acquired the business of competitor JetCorp Technical Services in 2009. “It was needed as demand for our cabinetry and completion skills was outstripping our capacity, all of which coincided with a rise in demand for OEM cabinetry work,” he adds. “Naturally, alongside the cabinetry comes other work related to interior completions, including detailed upholstery of seats, bespoke galley creations, manufacturing of customized monuments, and the design of upgraded connectivity solutions.”

Even though the expansion was completed at the beginning of March, Sean says the company isn’t done yet. “We anticipate a second phase of development in the US later in the year,” he says.

The expansion follows hard on the heels of the announced investment by private equity firm New Heritage Capital, which was made in February. The Boston-based company became a minority stakeholder in Flying Colours, enabling the company to expand its service lines, infrastructure and existing facilities, as it did in St. Louis.

AERIA Luxury Interiors

Although smaller and perhaps less known than other interior players, AERIA Luxury Interiors is renowned for its relation to VT SAA, part of the world’s largest MRO services provider, Singapore Technologies (ST) Engineering. VT SAA’s hub at its San Antonio headquarters provides AERIA with the ability to connect with other divisions throughout the ST network and leverage interior designs and products for its own projects.

Founded by the legendary aviation designer Dee Howard and originally known as the Dee Howard Company, the company underwent a complete makeover in 2012. Rebranded as AERIA Luxury Interiors, the company started focusing primarily on corporate airliner completions after having obtained the required approvals from Airbus Corporate Jets and Boeing Business Jets in 2014. Since then, AERIA has prided itself in calling aerial luxury its area of expertise.

In February, during the 2018 Singapore Airshow, the company announced that it had reeled in its third BBJ completion contract since 2014, a particularly steady pace considering the average turnaround time for a corporate airliner completion. After a series of meetings with the undisclosed owner of the Boeing 737-700, AERIA came up with a design that features a VIP stateroom and...
adjacent lavatory with a shower cabin – in addition to a separate office, passenger and crew galleys, and a dedicated staff zone. The design features wood, fine leather and fabrics, and an impressive amount of gold plating.

The aircraft arrived during the first quarter of this year at the company’s headquarters in San Antonio, the so-called birthplace of large cabin completions. Here, in the original orange hangers of DHC, AERIA has a 100,000 square-feet facility within VT SAA’s 700,000 square-feet complex. Last year, the company added a 10,000 square-foot upholstery and cabinet shop to this already impressive footprint.

At present, over 600 people work at the company’s 340,000-square-feet hub in San Antonio. After being acquired by Saudi Arabian MAZ Aviation, the company impressively expanded its bases of operations through a series of takeovers in Germany and Morocco. What’s more, the company has also substantially expanded its US presence through the leasing of close to 850,000 square feet in Fort Worth, Texas. This amount of space allows for simultaneous work to be performed on up to six wide-body aircraft. But the good tiding didn’t end there. In 2016, it was revealed that the company was involved as a Boeing subcontractor servicing parts to Air Force One.

**Duncan Aviation**

Still States-side is Duncan Aviation, launched by Donald Duncan in the 1950s. The Iowa farmer started out as a Beechcraft distributor, after which fueling, MRO, avionics, accessory and painting services were added to the company’s portfolio. But it wasn’t until 1981 that the company took its first dive into the world of interior completions. 

**GDC Technics**

It’s no wonder that San Antonio is referred to as the birthplace of large completions and cabin interior design, considering that the city is home to GDC Technics. As one of the first completions centers in the US to be approved by BBJ and ACJ, GDC Technics quickly established itself as a leader in interior completions for Heads of State and VVIPs.
Although today the company is more active in the MRO and avionics field, Duncan Aviation does have a long list of approvals for cabin interior projects, including for Bombardier, Dassault, Cessna/Texton Aviation, Embraer, Gulfstream, Hawker and Beechcraft aircraft.

Duncan Aviation works intensively on creating awareness about your aircraft’s lifespan, including its parts, avionics systems and interior products. As a result, it has created an actual manual, written by interior experts and titled “How to Extend the Life of an Aircraft Interior” – all part of its mission to make owners realize that regular check-ins are absolutely required if you want to get the best out of your aircraft. According to the manual, and as with any other vehicle, parts of an interior will wear out long before a next complete refurbishment is due. Through frequent and phased interior repairs, Duncan’s goal is to educate operators and aircraft owners on how to keep their interiors looking new.

Another noteworthy thing about Duncan Aviation’s services is that it hand-crafts nearly every aspect of an interior. This has led to several innovative products and signature collections, including its own seat design and upholstery, stone flooring, custom pop-up cabin dividers and interchangeable cabinets.

The company recently broke ground on a new, 222,000 square-feet complex at its Provo, Utah, location. The added buildings will predominantly serve the region’s increasing needs for MRO and modifications services and will also include an innovative paint facility. The company’s Provo location opened its doors in 2010 and has since then performed work of all types, including several interior projects for business aircraft from across Europe, the Pacific and the Americas. The $70-million-dollar facility will offer large hangar spaces, along with back shop and office space. It is expected to be completed by the end of 2019.

Comlux

Another very well-known player in the large-cabin, corporate airliner interior services sector is Comlux – short for comfort and luxury. Located in Indianapolis, Indiana, Comlux Completion has been performing interior work since 2009 on BBJs, ACJs – and even Sukhoi Business Jets.

In order to guarantee a clear vision and unified approach, the company launched its own VIP cabin design office, called Comlux Creatives. The team at Comlux Creatives approaches every new project through the company’s Five Senses concept, which takes the customer through a sensory journey across all five senses. First, the team of designers listens carefully to define the customer’s needs, after which they conceptualize those needs to express the personal taste of the customer. Next, the concept is brought together with materials so that the customer can touch what will be used, after which every small detail of the concept is put into drawings to show the customer how everything comes together. Finally, the journey ends with the sweet smell of success.

A lot of firsts have happened at Comlux over the last year. In April, the company delivered its first custom-made VIP cabin for a Sukhoi Business Jet. The cabin for the Kazakhstan-based aircraft was certified by EASA and features a configuration with 19 seats in a contemporary corporate interior. The front of the cabin features a VIP area with a four-club seating area and a side-facing sofa, followed by an executive section with 15 first-class seats in a two-by-one, three-abreast configuration.

The entire project took a year to complete and obtain certification. Comlux Completion CEO Scott Meyer said the project was the first of its type to be outfitted in corporate configuration and certified by EASA. “This made it especially challenging, given the completion operations happened in the US on an aircraft without FAA TC,” he says. “This once again showcases how Comlux can adapt and find solutions in any environment to best serve our customers.”

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Four months later, in August of 2017, the company announced it had reeled in its first ACJ320neo cabin completion project. The corporate airliner is expected for delivery in its green state in September 2019, after which Comlux will take approximately ten months to complete at its Indianapolis facility – one of the shortest completion cycles to date. “We are running several ACJ neo and BBJ MAX cabin sales campaigns right now and we are expecting to sign more contracts before the end of the year,” says Meyer.

Less than two months later, the company was awarded its first cabin outfitting contract onboard a BBJ MAX 8, slated to arrive in Indianapolis in the last quarter of this year. Again, the turnaround for this corporate airliner is set tightly, with a projected re-delivery by the fall of 2019. “The first MAX 8 signature, together with the neo cabin contract, are paving the way in establishing Comlux as a leader in the VIP completion market and in building a bright future for our company and its employees,” adds Meyer.

Get Inside at EBACE

Of course, this is just the tip of the interiors iceberg – there’s simply too many companies doing too many things on the inside of too many aircraft for us to cover this short preview article. And really, there’s no better way to learn the latest on the interior business then to get inside an aircraft and see for yourself. So, when you’re walking the EBACE halls or exploring the static display, be sure to take a moment to poke your head inside!
Earlier this year, Jet Aviation Geneva installed its first Honeywell JetWave satellite communications system on a Bombardier Global 6000 and plans to do a second similar installation in May. JetWave terminals operate on Inmarsat Aviation’s GX Ka-band network to provide high-speed broadband connectivity. The KA-band system was installed in combination with a Honeywell CNX-900 Router in less than 21 days. Jet Aviation’s Geneva MRO facility offers full heavy maintenance services for Bombardier Global Express series, Gulfstream aircraft and Boeing BBJ. Last year, the facility conducted its first Honeywell DU-875 ELITE cockpit display upgrade on a large-cabin, ultra-long-range Global Express XRS.

In February, Jet Aviation officially opened its third hangar at the Seletar Aerospace Park in Singapore, adding 3,850 square meters to its hangar space there, enough additional space to accommodate two Boeing Business Jets (BBJs) or Airbus Corporate Jets (ACJs), or five Gulfstream G550 aircraft. It features a larger, upgraded Interior Shop, including a 300-square-meter extension for drying rooms, a new soft goods area and Wood Shop, and also adds 315 square meters of storage space. Jet’s total under roof space at Seletar now amounts to 11,650 square meters. “Jet Aviation is fully committed to meeting the needs of our customers as close to demand as possible,” said John Riggir, general manager of Jet Aviation’s MRO and FBO facility in Singapore and vice president of the company’s operations in Asia. “Whether that means investing in infrastructure or the latest technologies, we remain focused on meeting their requirements to the highest quality and safety standards – which this new hangar clearly demonstrates.”

Canada-based Flying Colours has officially opened its new facility in St. Louis, Missouri which will primarily support the design, build and finishing of woodwork monuments for large business jet cabins. The St. Louis KSUS footprint is now close to 100,000 square feet and has required the addition of a further seventy team members, making a total of 180 Flying Colours employees based in the USA. “This is the first full infrastructure development to take place in St. Louis since we acquired the business in 2009. It was needed as demand for our cabinetry and completion skills was outstripping our capacity. This coincided with a rise in demand for OEM cabinetry work. The expansion reflects our overall strategic approach to business growth, and we’re not done yet as we anticipate a second phase of development in the US later in the year,” said Sean Gillespie, company executive vice president. While the space was initially specified to expand the monument capacity of the business, Flying Colours has maximized the footprint to create spaces for upholstery, engineering, and avionics work, as well as production control offices, conference rooms, and client meeting areas. “Naturally alongside the cabinetry comes other work related to interior completions including detailed upholstery of seats, bespoke galley creation, manufacturing of customized monuments, and design of upgraded connectivity solutions,” said Gillespie.

GOOD TIMES FOR MROs

Worldwide MRO activity is on the upswing thanks to a combination of an increase in Business Aviation flight hours and looming deadlines for avionics mandates such as ADS-B. Mark Huber reports
To support working with composite materials a new “Edge Fill” machine fills the voids in composite panels after being cut and shaped by the CNC machine. The addition of two hi-tech paint booths ensures optimal surface appearance before final treatment in the new enclosed curing room. Flying Colours has also invested in a third booth dedicated to painting complex fasteners, and cabinet interiors. The facility’s layout ensures that the manufacturing follows the natural workflow with projects beginning on the CNC, before moving on to the expansive machine room which incorporates a selection of detailing tools for woodwork/cabinetry. Paint, finishing, framing and assembly follow, before the final quality control inspection.

Separately, Flying Colours announced that Boston-based private equity firm, New Heritage Capital, has become a minority stakeholder in the business. Heritage specializes in partnering with founder and entrepreneur owned businesses that want to significantly grow. Flying Colours will retain its management and operational independence, and will benefit from increased financial resources at a time of considerable growth. The deal enables Flying Colours to realize high-value projects which include expanding service lines, infrastructure development, and the building of additional hangars.

Bombardier also is reporting an uptick in MRO activity. Since it opened its Singapore service center there in 2014 it has recorded 2,200 customer visits and quadrupled its engineer and technician workforce. It has successfully completed heavy maintenance inspections including 96- and 192-month inspections on Challenger aircraft, as well as 120- and first-ever 240-month inspections on Global aircraft. The facility also performed the first-ever installation of Ka-band on a Global business jet. The facility has received 22 certifications from international authorities, 10 authorizations from engine and avionics OEMs, and Bombardier’s London Biggin Hill Airport facility has supported over 40 maintenance events, including a Ka-band high-speed internet with Rockwell Collins Airborne Data Router (ADR) retrofit installation. Bombardier is also preparing for future growth with its Global 7000, building a $65 million Center of Excellence to handle completion work on that aircraft. When fully functional at mid-year, the center is expected to employ up to 1,000 people. Last year Bombardier opened a new interior facility at its 1 million square foot Tucson, Arizona service center. The facility features a fully climate-controlled work environment and expanded capacity, regrouping its interior design expertise and talent in one atelier. In addition, the meticulous state-of-the-art cabinet workshop has tripled its footprint from 1,092 square feet to 4,800 square feet, and will complement existing seat and divan upholstery fabrication areas. The facility services both Bombardier commercial and business aircraft, and employs more than 900 engineers, technicians and staff.

Textron Aviation is increasing its global service network and capabilities. Last year the company doubled now comprising nearly 6,000 unique part numbers – at its regional parts distribution hub within the Singapore Service Center. Further streamlining parts distribution and efficiency, customers can now order parts online direct from the Singapore warehouse. It also strengthened its service relationship with Aerolineas Ejecutivas to the benefit to customers in Mexico and throughout Latin America.
Textron Aviation announced that Aerolíneas, currently and authorized service facility for Beechcraft and Hawker products, would also become one for Cessna Citation jets.

Duncan Aviation has acquired Capital Avionics’ MRO repair services, bolstering Duncan’s recent designation as one of only four BendixKing service partners in North America, and 14 worldwide authorized to repair, overhaul and sell BendixKing components. Duncan has 50 years supporting and servicing BendixKing components and has built an extensive list of repair and overhaul capabilities.

“With Capital Avionics’ assistance, training, and expertise, we are equipped and ready to provide a seamless service transition for Capital Avionics customers. Duncan Aviation will honor all existing warranties and provide direct points of contact for account and technical assistance,” said Mark Cote, Duncan Aviation Vice President of Parts Sales, Avionics, Accessories and Satellites. Along with additional capacity, Duncan Aviation has added the following repair and overhaul capabilities: EFIS 40/50 System, KAI 487 Airspeed Indicator, KAS 297C Digital Altitude Selector, KC 192 (-15) Autopilot Computer, KC 140 Autopilot Computer, KC 225 System, and KDC 481 Air Data Computer.

Separately, Duncan said it is offering incentives and Early Adopter packages for Citation Excel and 560XLS operators who want to upgrade their flight deck to Garmin G5000 avionics. Supplemental Type Certification for the G5000 is targeted for late 2018/early 2019. A limited number of Early Adopter deposit opportunities will be available through Duncan Aviation with a variety of incentives, and the company states that interest among operators is high. The G5000 integrated flight deck modernization program for the Citation Excel and Citation XLS includes a dual multi-sensor flight management system (FMS) and three high-resolution 14-inch flight displays situated alongside dual touchscreen controllers with features including intuitive menu structures, include weather, synthetic vision, electronic flight charts and aircraft synoptics. The upgrade offers lower cost of operation, exceeds modern airspace initiatives and solves parts obsolescence among the Citation Excel/XLS with zero-time avionics.

StandardAero is planning $16 million worth of expansion and investment at its facilities in Ohio (Cincinnati & Hillsboro) and Florida (Miami) during 2018. The plans cover the costs of construction and capital equipment. The Cincinnati location expansion will include the build-out of an additional 200,000 sq. ft. of work space to accommodate component repair growth on new platforms, military and commercial engine component repair, as well as
well as larger components. Miami will add 30,000 sq. ft. of working space and capital improvements including the installation of a state-of-the-art clean line, an additional vacuum furnace as well as water jet cleaning capabilities. As a result, the facility will be able to repair large engine cases. Hillsboro will be completing a 30,000 sq. ft. expansion to support new OEM manufacturing production, bringing the facility’s total manufacturing footprint to 115,000 square feet of space.

Separately, StandardAero purchased helicopter MRO Vector Aerospace from Airbus last year. Vector generated revenues of over US$700 million in 2016 and employs approximately 2,200 people in 22 locations across Canada, the United States, the United Kingdom, France, Kenya, South Africa, Australia and Singapore. The newly combined company, which will maintain the name of StandardAero, has more than 6,000 employees in 42 locations across five continents, with annual revenues of approximately US$3 billion.

Lufthansa Technik continues to grow all facets of its MRO business, announcing in late March the construction of a joint venture next generation jet engine service and overhaul facility in Poland with MTU for 150 million Euros. This year the company will begin completion of its first 787-8 VIP aircraft.

The MRO division of MTU Aero Engines AG recorded its most successful year ever in 2017 with $3.7 billion in contract wins, $1.5 billion more than 2016. MTU Maintenance Lease Services BV, operating out of Amsterdam, Netherlands, also broke records in 2017. The young and successful start-up more than doubled sales versus 2016, welcomed over 60 new lease and asset management customers and nearly doubled its pool of lease engines. In 2018, the company will be focusing on technical engine asset management services as well as flexible MRO and asset management solutions for asset owners and operators.

RUAG Aviation is busy offering ADS-B upgrades for older business jets such as the Challenger 601 which are often combined with a major inspection event. “This is a milestone on behalf of our customer, as well as on behalf of all operators of older aircraft,” states Volker Walldrodt, senior vice president of Business Jets, Dornier 228 & Components, RUAG Aviation. “For aircraft like the Challenger CL601, flying with ADS-B today provides pilots with a number of immediate benefits, yet it also ensures the aircraft is equipped to fly after December 31, 2019.” The ADS-B upgrade on the Challenger also included the Wide Area Augmentation System (WAAS) for Global Positioning System (GPS) sensors, FMZ 2000 Flight Management System software version 6.1, Future Air Navigation System (FANS) 1/A, and Protected Mode Controller Pilot Data Link Communications (PM-CPDLC).

Aero-Dienst is booking up with large cabin heavy inspections, taking in three C checks on Falcon 7Xs and a 120 month inspection on a Bombardier Global Express XRS. Work on one of the Falcons included installation of a quick access recorder and implementation of a new comprehensive demo service bulletin for the fuel tank. The company also announced that it is opening a new component repair shop this year in Landsberg am Lech, Germany and has opened a new maintenance line station in Klagenfurt.

AMAC Aerospace continues to focus on completion, refurbishment and MRO work on VIP aircraft, processing a diverse fleet of including Airbus A340-200, Boeing B777-200LR, B747-8i and BBJ models in recent months. The 12-year inspection and full refurbishment carried out on the A340 was the most extensive in AMAC’s history, requiring 22,000 maintenance man hours and 10,000 hours of production shop work performed in parallel to the maintenance check.
Blackhawk Modifications has been in the business of providing major engine upgrades since 1999. However, like most companies in the modifications sector, the recession hit Blackhawk hard. “Our business was doing pretty well up until 2008 when the economy collapsed,” says President and CEO Jim Allmon. “The next eight years were a struggle.”

But things are starting to change. According to Allmon, over the past two years there has been a significant uptick in people wanting to upgrade their engines. “There are a lot of owners who have been sitting on the sidelines waiting for some signs that the economy is recovering,” he says. “With the economy now well into a serious recovery mode, I believe many people have seen those signs.”

Most recently, the Waco, Texas center has received STC approval for a new engine upgrade of the King Air 350, taking it from the original PT6A-60A to the PT6A-67A, adding about 300 thermodynamic horsepower per engine. “Engine upgrades are the bread and butter for Blackhawk, and will be for many years to come,” adds Allmon.

Blackhawk continues to enter into new areas of aircraft modification through select partnerships. “Like so many other companies, we are aligning ourselves with cutting edge companies to bring innovation and value to the modification business,” says Allmon. “With our partner companies, we are working on auto throttle applications for the PT6A engine, next-generation engine technology with full automatic engine controls, lighter composite prop solutions, lightweight lithium-ion batteries, and new interior designs that make current generation interiors look like at Model T.”

But the recovery is by no means limited to engine upgrades – airframe modification companies are feeling it too. For example, Aviation Partners reports having seen a gradual increase in retrofit Blended Winglet sales over the past two to three years. Thanks to steady improvements in the resale market, the company says sales have been particularly good over the past 12 months. The company’s retrofit Blended Winglets have saved the world’s commercial and business jet operators an estimated 7 billion gallons of jet fuel and a corresponding global reduction of 74 million tons of CO2 emissions since they were introduced in 1994.

Speaking of airframe modifications, Raisbeck Engineering has been working with partner Hartzell Propeller on a marriage of the latter’s 21st Century Aircraft Modifications Recovering Nicely

As the decade of the recession draws to a close, the Business Aviation industry is beginning to recover, drawing along with it the aircraft modifications business – engines, airframes and avionics in particular.

Kirby Harrison reports
Advanced Composite Technology with Raisbeck’s Swept Blade Turbofan Propeller technology. Since the first four-blade swept props were certified for the King Air in 2013, the improvements have been steady – all designed using advanced computational fluid dynamics hardware and software to investigate drag reduction and performance improvement. The most recent innovation is the new five-blade, composite swept prop for the King Air 350, certified in late 2017. Next up is the same propeller for the King Air 300, with an STC anticipated as early as April of this year.

The company is continually seeking out other companies with which to partner, form joint programs, or simply acquire. “A partnership with Butterfield Industries has already been completed and four others are in active investigation, and some of them would immediately quadruple our payroll as well as our capabilities, especially in large-scale engineering projects,” says founder Jim Raisbeck. While some aircraft modifications businesses take a rather fine focus on particular specialties in the industry segment, others are far more diversified. Many of them, like Duncan Aviation, not only include airframe, engine and avionics work, but also do cabin refurbishment and landing gear assemblies. Take the Lincoln, Nebraska company’s ATG (air-to-ground) communications system as an example. It has installed nearly 1,000 systems and in the last year has completed, started or planned for several Gogo AVANCE L5 STCs, including certain aircraft in the Bombardier, Falcon and Gulfstream families.

As the industry moves towards bigger and newer aircraft, Duncan hasn’t stood idly by. Instead, it has been constantly expanding to include service on engines powering those aircraft. In fact, currently under construction is a new engine test cell at the company’s Lincoln location. The mobile engine rapid response teams now total 36 technicians who travel from 16 launch offices, and additional engines and new engine models have been added to the rental pool.

Busy Times for Avionics

Perhaps no Business Aviation modifications segment is busier than that of avionics, with the ADS-B requirement being the driving force. According to the Aircraft Electronics Association, worldwide avionics retrofit sales for 2017 amounted to $1.342 billion, a 20.1% increase over 2016. In fact, retrofit avionics sales amounted to 57.7% of total sales in 2017.
AEA President Paula Derks points out that the retrofit surge might be attributed to aircraft owners choosing to have other avionics work done while simultaneously coming into ADS-B Out compliance. “Many avionic shops are telling us that aircraft owners are electing to order full-panel avionics upgrades rather than just ADS-B equipment,” she says. “It will be interesting to see whether the retrofit market continues to grow significantly in the next two years as the mandate draws closer.”

One of those shops is Elliott Aviation, which has STCs that provide seamless integration to existing cockpit controls, including TCAS II equipped aircraft. In addition to ADS-B OUT, the STCs also include ADS-IN using a Bluetooth-compatible device through Garmin’s Flight Stream wireless platform. With its shops filling up fast with ADS-B installation work, Elliott is offering STC kits to be installed at any Garmin dealer in the world, with the exception of the Premier 1 and 1A.

Outside of ADS-B work, the company recently launched its Elliott Connect system. “Customers can now apply, change orders and get quotes, review invoices and work orders, and manage warranty programs quickly and easily through the app,” says Elliott Aviation Vice President of Aviation Programs and Operational Logistics Mark Wilken. “It also allows them to upload documents and photographs related to their aircraft directly from their device and communicate with Elliott team members to answers questions.”

The importance of ADS-B compliance is no less a driver of the avionics business in Europe. RUAG is a major supplier, support provider and integrator of systems and components for civil aircraft worldwide and is very much involved in the ADS-B install business. “Equipping older aircraft with ADS-B transponders improves operation flexibility and preserves investment well past the 2020 requirement,” says RUAG Aviation Vice President Volker Wallrodt. “It allows those aircraft to continue to operate reliably and profitably, while adhering to the latest aviation regulations with state-of-the-art technology.”

Engineering specialists at RUAG integrate completion solutions so older aircraft like Bombardier’s Challenger 601 and Dassault’s Falcon 900 meet the full scope of EASA and FAA standards for ADS-B, including the later DO-260B. The 601 avionics project includes wiring, modifications and new mechanical and electrical installations, as well as an upgrade of existing transponders to comply with the DO260B standard for ADS-B Out.

Part of the upgrade project was the introduction of the Wide Area Augmentation System (WAAS) for GPS sensors and the new FMZ 2000 Flight Management System software. Future Air Navigation System (FANS) 1A+ and Protected Mode Controller Pilot Data Link Communications are planned for later installation.

Not surprisingly, the avionics upgrade for the 601 was combined with a scheduled maintenance, repair and overhaul event, also managed by RUAG. This optimized downtime enabled the business jet owner to achieve significant savings on both time and budget. “We recommend
that all operators, especially operators of older aircraft, begin the upgrade process as soon as possible to ensure individual schedules and operations can continue as planned,” adds Wallrodt.

Niche and New Markets
Advent Aircraft Systems has its own successful niche market, having recently unveiled its concept for a new, self-contained electric power brake system (ePBS). The ePBS aims to tap into the developing all-electric aircraft, new aircraft with traditional hydraulics but that desire an electric braking system, or as a retrofit system for existing aircraft. Incorporating the original Advent eABS as an integral part of the overall design, the ePBS will be a brake-by-wire system that consists of brake pedal sensors and feel units, primary brake electronic controllers, parking and emergency brake controller, wheel speed transducers and hubcaps, as well as both primary brake and emergency/parking brake hydraulic units.

“The success of the Advent eABS has yielded invaluable feedback from customers and the all-electric braking system was the next logical step,” says Advent President Ron Roberts. “Using the eABS as the basis to develop the ePBS, it not only has built-in efficiencies from a production standpoint, but also provides an opportunity to expand our customer base.”

Many modification centers are not content with the status quo, but are actively developing new technology and new markets. For example, Honeywell describes the DU-875 as a plug-and-play, one-for-one upgrade option for operators desiring a lower-cost, building block approach to future growth.

Upward Momentum
It is difficult to imagine the aircraft modifications business going in any direction but up, considering the gathering strength of the US economy and the positive impact it has traditionally had on the Business Aviation industry. Looking ahead, the 2018 Knight Frank Wealth Report offered indications of good news for the business and private aviation market, pointing out that while the number of high net worth individuals worth $50 million grew 20% from 2012 and 2017, it is expected to show a substantially larger jump to 43% between 2017 and 2022. The report further forecasts that the ranks of those worth $500 million or more may increase by 39% from 2017 to 2022.

All this is good news for the modifications industry. For example, Raisbeck Engineering predicts that sales for 2018 will grow another 17%, not including new product introductions. Likewise, Blackhawk is equally optimistic: “Unfortunately, the OEMs can’t always respond fast enough or in an economic way to meet the needs of a given market segment, but companies like Blackhawk can meet these needs quickly and efficiently,” says Allmon. “We can approve an entire new engine upgrade in less than 18 months – and sometimes less than 12.”

But perhaps Dr. Johannes Bussmann, CEO of Lufthansa Technik, sums it up best: “Never before have we generated so much revenue, supported so many aircraft or employed so many people,” he says. “With this foundation, we will stick to our course, growing throughout the world and driving the entire industry forward.”
FlightSafety has started Pilatus PC-24 pilot training at its Dallas facility.

**FLIGHT SIMULATION**

ANSWER TO THE PILOT SHORTAGE PROBLEM

The best way to invest in professional pilots is via flight simulators. Several companies share this market, and all are constantly evolving to follow the development of new aircraft models.

Marc Grangier takes a look at these companies.

According to Lacy, a good professional pilot is worth investing in, and the best way to do so is via flight simulators. Several companies share this market, and all are constantly evolving to follow the development of new aircraft models. “The continuous evolution of pilot training programs and regulations is driving demand for high-fidelity simulators and flight training devices that realistically simulate the performance and flying characteristics of today’s training aircraft,” says Frasca International President John Frasca. Here BART looks at some of the leading training companies.

**FlightSafety International**

FlightSafety International is among the top professional aviation training companies and suppliers of flight simulators, visual systems and displays. It operates one of the largest fleets of full-flight simulators at its training locations in the United States, Australia, Brazil, Canada, China, France, Japan, the Netherlands, Norway, South Africa and the United Kingdom.

Last February, the company started providing training for the new Pilatus PC-24 aircraft in Dallas. This new FS1000 simulator is equipped with the latest advances in technology, including the VITAL 1100 visual system, electric motion and control loading, and new Instructor Operating Station. The pilot and maintenance technician training programs will also utilize MATRIX, FlightSafety’s Integrated Learning System, which offers Graphical Flight Deck Simulators for instructor-led and self-paced learning.

Earlier this year, FlightSafety International and Gulfstream announced that the first full flight simulator for the new G500 aircraft had received interim Level C qualification from the FAA. “The certification of the G500 full flight simulator is a major step forward as we prepare for the G500 to enter service later this year,” says Gulfstream President Mark Burns. A second simulator, which will be interchangeable between the Gulfstream G500 and G600, will be qualified following aircraft certification. Pilot and maintenance technician training will then begin using both simulators at FlightSafety’s Learning Center in Savannah, Georgia.

These are the first business jet simulators equipped with FlightSafety’s CrewView collimated glass mirror display, which provides distortion-free optical performance with greater clarity, sharpness, and brightness. The Gulfstream G500 and G600 training programs will also feature new MATRIX integrated training system devices, including advanced technology classroom workstations, Graphical Flight Deck simulators and FAA Level 4 qualified Flight Training Devices.

FlightSafety International also indicated that its third full flight simulator for the Gulfstream G280 aircraft has been installed at its Learning Center in Savannah, Georgia and entered service last March. The first two simulators for the G280 are located at its Learning Center in Dallas, Texas.

Concerning helicopter training, FlightSafety International recently started pilot training on its new Airbus Helicopters EC130T2 full flight simulator, located at its Learning Center in Denver, Colorado. The center is also equipped with Level D qualified simulators for the Bell 407GXP and Airbus Helicopters AS350 B3 and EC135. The FS1000 simulator, built for the Airbus Helicopters EC130T2, includes FlightSafety’s VITAL 1100 visual system and CrewView collimated glass mirror display. The glass mirror display allows for an expanded field of view with superior image quality compared to Mylar display systems. The addition of collimated chin window displays adds further realism to the hover and landing phases while also improving the ability to train such maneuvers as steep approaches and confined area landings.

For industry pioneer Clay Lacy, there is no debate: A pilot shortage would have a crippling effect on the world today. The job outlook for professional pilots has had its ups and downs, but in the current economy the balance has clearly shifted. Already there are simply not enough qualified pilots to meet demand, much less the significant growth expected over the next two decades.
TRU Simulation + Training
TRU Simulation + Training, a Textron company, has received full program certification for its Cessna Citation Latitude and Cessna Citation Sovereign plus pilot training program. It is now accepting students at its TRU ProFlight Pilot Training Center in Tampa, Florida. In March 2017, the Full Flight Simulator (FFS) for the Latitude/Sovereign + program received Level D qualification by the FAA. TRU’s ProFlight Pilot Training Center-Carlsbad currently offers pilot training programs for Cessna Citation CJ3, CJ4 and Cessna Conquest I (425) and Conquest II (441) aircraft.

TRU recently signed a letter of commitment to provide six Flight Simulation Training Devices (FSTDs) to Emirates Flight Training Academy, based in Dubai, UAE. The FSTDs, expected to begin delivering in late 2018, will feature TRU’s ODYSSEY 7 technology, which brings a new level of realism to fixed wing aircraft through a state-of-the-art mini-motion system.

Supporting the center’s ab initio training program, three of the devices will be provided for the SR-22, while the other three will be provided for the Phenom P100EV. All devices will be EASA qualified. The Emirates Flight Training Academy, based at Al Maktoum International - Dubai South, is designed to be one of the most innovative flight training facilities in the world, offering a capacity of up to 600 cadet pilots. Training modalities at the academy include a mixture of classroom learning, flight simulators and training aircraft.

CAE
Last January, CAE purchased 45% of the shares of Pelesys, one of the main providers of aviation training solutions and courseware. Based in Vancouver, Canada, Pelesys has over 100 customers worldwide. Pelesys’ Training Management and Deployment System (TMDS) includes courseware deployment, training management, qualification management and electronic training records solutions. Pelesys also offers a comprehensive library of commercial aircraft type courses for all major types, as well as over 30 special operations courses – all of which are available for both initial and recurrent training. Through this partnership, CAE has strengthened its courseware offering and consolidated its cadet-to-captain training delivery across its global network.

At the end of 2017, CAE and the Saudi National Company of Aviation (SNCA) signed a collaboration agreement for the creation of a CAE Authorized Training Center in the region. Under the terms of the agreement, CAE will provide the authorized training center, located in Dammanm, Saudi Arabia, with the key elements for cadet training, including: pilot license curriculum and courseware, training staff and instructors, and safety and quality control systems. The new CAE Authorized Training Centre will be located at King Fahad International Airport in a dedicated 40,000 square meter site.

Frasca International
Frasca International, based in Urbana, IL, is celebrating its 60th anniversary this year. Over the last six decades, the company has supplied over 2,600 flight simulators to some 70 countries worldwide. Earlier this year, Frasca received an order for two FTDs from Sichuan Fan-Mei Aviation Industry Co., one for the Piper Seminole and one for the Robison R44. Both FTDs are built to CAAC Level 5 Standards. Sichuan Fan-Mei Aviation Industry Co. is located in Beichuan County, Sichuan Province, China.

The Level 5 Seminole FTD features Garmin G1000 avionics, KR87 ADF, Frasca’s Simplicity Instructor
Universal Avionics’ InSight Display System (left). Bombardier introduced a new Challenger 300 simulator at its Dallas facility (right).

Station (IOS) and 180° x 45° visual display with TruVision Global visual system. The Level 5 R44 FTD also includes Simplicity IOS and a Garmin GTN 650 GPS/NAV/COM unit.

Frasca has numerous CAAC certified simulators in service throughout China. Last Summer, the company received an order for a second Cessna CJ1+ Level 5 FTD from CAE Oxford Aviation Academy in Mesa, Arizona.

Jeppesen
Jeppesen has reached an agreement to provide its high-fidelity Airport Mapping Database to Universal Avionics’ new InSight Display System, providing timely and accurate airport diagrams and other essential information to enhance operational efficiency. Specifically, Jeppesen will provide Airport Mapping Database information, digital charts, NavData navigation information and cultural data services for the InSight Display System. Jeppesen data will allow for the three-dimensional display of essential airport information and en-route flight data through the InSight platform, thus further enhancing situational awareness for pilots.

Bombardier
Bombardier has expanded its Challenger 300 training capacity in Dallas, Texas, complementing the existing Challenger 350 aircraft training program. With six Level D full-flight simulators, one flight training device, 21 interactive classrooms and numerous part task training devices, Bombardier’s Dallas Training Centre can train up to 3,000 pilots and 280 maintenance technicians per year.

Bombardier operates a total of 11 aircraft simulators – six in Dallas and five in Montreal. As Bombardier’s Authorized Training Provider (ATP) for Challenger series aircraft, CAE also delivers training for Bombardier aircraft on 16 full-flight simulators located across CAE’s global network, including centers in Amsterdam, Burgess Hill, Dallas, Dubai and Morristown.

For this reason, FlightResearch has set up its Upset Recognition and Recovery Training (URRT). It’s mission: to help save lives. Designed to take pilots to an advanced stage of learning by incorporating academics from its flight test syllabus, URRT teaches about aircraft certification testing, limitations and how these relate to aircraft capability and performance in the air. Pilots learn lifesaving recovery techniques in flight and at altitude, preparing them for in-flight situations where the majority of aircraft accidents and fatalities occur due to pilot recognition failure and/or improper recovery procedures.

Based in Mojave, CA, Flight Research was created by the founders of the National Test Pilot School (NTPS). Their instructor pilots include two Space Shuttle Test Pilots, who have a combined total of five space flights, and two highly experienced Flight Test Engineers from the AF Test Pilot School at Edwards Airforce Base. The school utilizes aircraft that emulate the aircraft their customers fly, including a North American Rockwell Sabreliner 65 twinjet. The Sabreliner 65 allows pilots to maneuver an airplane very similar to their home aircraft while learning to recognize and recover from upsets. Flight Research URRT meets all FAA, EASA, and ICAO UPRT compliance standards.

But Sometimes You Can’t Beat the Real Thing

Under certain circumstances, such as loss of control in flight (the number one cause of accidents worldwide) simulator training is simply not sufficient. This is acknowledged by the NTSB, FAA, ICAO, EASA and other regulatory agencies throughout the globe. “A data-driven approach to pilot training is an essential element in continuing to improve the industry's safety performance,” says Flight Safety Foundation President and CEO Jon Beatty. “Training must target real-world risk and ensure a progressive and satisfactory performance standard.”

Pilots of high performance aircraft are not always receiving the right training needed to be able to correct, for example, a loss of control. This is because flight simulators do have their limits, due mainly to aerodynamic validations and motion cueing limitations. Furthermore, research has shown that most pilots who experience accidents could have handled the situation if they had the proper training.

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So whether it’s in a simulator or up in the air, each of the training companies listed here are doing their part to keep our cockpits equipped with professional pilots.
SAVE THE DATE FOR THE WORLD’S LARGEST BUSINESS AVIATION EVENT

Join over 25,000 industry professionals for the most important three days of business aviation, with 1,100 exhibitors, 2 static displays of aircraft - one inside the exhibit hall and the other outside at Orlando Executive Airport, and more than 50 education opportunities. Save the date and visit the NBAA-BACE website to learn more.

www.nbaa.org/2018
The role of the aircraft scheduler and dispatcher is one involving a range of ever-expanding responsibilities. Route and documentation planning, access to airspace and airports, and managing risk in disruptive weather situations are just some of the critical functions on the typical to do list of your average scheduler and dispatcher – all of which were hot topics at NBAA’s 2018 Schedulers & Dispatchers Conference (SDC2018).

As the premier professional development event for anyone with a foot in the world of scheduling and/or dispatching business aircraft, the annual event welcomed over 2,900 industry professionals to Long Beach, California. With the aim of bringing attendees up-to-date on the latest information critical to the scheduling and dispatching job function, the agenda was packed with top-level education sessions and a range of opportunities for peer-to-peer networking.

Luckily for those in attendance at SDC2018, the exhibit hall housed over 500 vendors and suppliers featuring the products and services that every scheduler and dispatcher needs. For example, Jet Aviation – who positions itself as one-stop-shop for all things Business Aviation – was onsite promoting its global network of 30 locations and portfolio of high-end services. “Schedulers and Dispatchers is the place to be for Business Aviation and one of the top events for talking to our customers and suppliers,” says Jet Aviation Senior Vice President Business Operations USA Dave Paddock. “At least from a US perspective, it is by far the most valuable event for all lines of our business, from FBOs to staffing, charter and MRO.”

Many companies echoed Paddock’s praise for SDC, noting in particular the advantage of the show’s small size and how this allows for more direct interactions. For Avfuel, having a large presence at the show means more touchpoints and connections. “As a fuel supplier, it’s crucial to take advantage of SDC as a chance to interact face-to-face with the industry’s fuel-buying decision makers – the schedulers and dispatchers – and to display the benefits of flying within the Avfuel network,” says Avfuel Vice President Contract Fuel Jonathan Boyle.
member can present FBO staff with the Avfuel Pro Card, the scheduler or dispatcher can create a pre-authorization that is given to the FBO, or they can use a variety of scheduling software with which Avfuel Contract Fuel price files are compatible.

In addition, Avfuel Contract Fuel offers schedulers and dispatchers easy online account management with access to electronic invoices. Should anything be needed, they can also contact Avfuel Contract Fuel staff at any time—24/7/365. Beyond this, flight crew members can put everything – fuel and non-fuel ancillary services – on one transaction with the Avfuel Pro Card, saving time at the front counter and keeping all items on one invoice for simplification management, while also benefiting from no transaction or annual fees.

“In terms of our network, we look to facilitate connections at the show between our Avfuel-branded FBOs and attendees,” adds Boyle. “At the end of the day, SDC is really all about awareness – making schedulers and dispatchers aware of the breadth of our locations and the benefit of flying to them and staying within the Avfuel Network.”

That network is rapidly expanding, with the company adding over 30 branded FBOs across North America and Europe last year, along with renewing key partnerships with Air Service Basel and Sheltair. At the start of this year, Avfuel welcomed 13 new branded FBOs in North America and Europe, including Italy’s ARGOS VIP.

Another fuel company promoting global growth was World Fuel Services (WFS). Last year, the company added over 50 new branded and unbranded supplied locations – including in the US, UK, France, Germany, Italy and Australia. The network now boasts more than 550 FBOs, 3,000 contract fuel locations, 7,600 AVCARD merchants, 17,000 trip support service vendors and 78 Air Elite Network Diamond Service locations. Many of these were on hand at SDC2018, as 60 FBOs from the WFS and Air Elite Networks were co-exhibiting at the show.

A Global Show
SDC isn’t just a US show, as it attracts providers from around the world – and in particular Europe. For example, TAG Farnborough was on hand to meet the people responsible for sending their corporate aircraft to the UK-based Business Aviation airport. “It’s actually a little harder to gain new business at the show now as the majority of companies who operate in the UK already know us, either because they’re existing clients or are already familiar with our facilities,” says TAG Farnborough Airport Events and Marketing Manager Elaine Turner. “The SDC delegates meet with our customers and business partners in a cozier setting,” says Euro Jet Marketing Manager aneta Balochová. “Compared to NBAA-BACE, this is a much smaller show, meaning we have more time to spend with our customers.”

Euro Jet was promoting its position as a trusted partner offering a unique network of locations spanning Central and Eastern Europe, the CIS and the Middle East. “What makes us different is that our network is created by real people who take care of our customer’s flights across our entire core region,” adds Balochová.

With its headquarters in Prague, the company is strategically positioned to serve the Easter European market, including the increasingly busy Balkan market. When operating into the region, having a trusted partner like Euro Jet on hand is important, as much of the area lacks the infrastructure of Western Europe and the US. So, when landing in places like Prague, Tivat, Dubrovnik, Zagreb, Bucharest, Constanta, Karlovy Vary, Sofia or Warsaw,
SERVICES
World Fuel Services (top right), TAG Farnborough Airport (center). Universal Weather offers FAA-approved dispatcher certification course (left).

Euro Jet FBO with VIP crew lounge can be a very welcomed sight. Another key differentiator is that all of the company’s ramp agents are English speaking and trained by Euro Jet in accordance with NATA Safety First standards.

Euro Jet used SDC to celebrate its 10th anniversary. “We have been very fortunate to have grown our business steadily over the past 10 years,” says Balochová. “We were very proud to be able to celebrate this achievement and communicate our many successes with all the attendees at SDC this year.” (To learn more about Euro Jet and its 10th anniversary, please see our one-on-one interview on page 102.)

Speaking of anniversaries, Cutter Aviation was on hand celebrating its 90th year in business. “We wanted to use the SDC stage to let everyone in the industry know that we are the oldest family-owned FBO network in the world,” says Cutter Aviation Director of Marketing and Communications Genaro Sanchez. “We also used the show as a chance to stay in touch with schedulers and dispatchers and remind them that we offer world-class FBO, line and charter services from our Phoenix, Albuquerque and Colorado Springs facilities.”

Information at Your Fingertips
Rockwell Collins was in Long Beach with its ARINCDirect Flight Manager. The service brings together all relevant pre- and post-trip international planning features and capabilities into one online location or app. Working seamlessly with dispatch and scheduling software, ARINCDirect Flight Manager provides planners, dispatchers and flight crews with up-to-the-minute information on everything that will affect a flight anywhere in the world. From storms over the North Sea to fuel shortages in Peru, ATC strikes in France or runway closures in the US – everything is available in a single location, including:

- Trip tracking through various formats – calendar view, folder view, global view and advanced search features

To help flight operations enhance their knowledge base, safety and efficiency, Universal Weather and Aviation offers a unique FAA-approved FAR Part 65 aircraft dispatcher certification course. The 200-hour course can be completed entirely in a classroom or via a blended classroom and online option. For the later, students start by completing 136 hours of coursework online, after which they must pass the FAA’s written knowledge test. They then go to Universal’s headquarters in Houston to complete the final 64 hours of classroom work, which is followed by a practical test with an FAA examiner. Topics covered include: aviation weather, ATC, regulatory requirements, navigation systems, aircraft systems, emergency preparedness and communications procedures – among others.

“First and foremost, the course is about safety, as the ultimate objective is to provide these future dispatchers with the information they need to get a flight safely from takeoff to its final destination,” says Universal Weather and Aviation Training Program Manager Gary Martin, who also leads the FAA Dispatcher Certification Course. According to Martin, those who go through the Universal course have a 97% pass rate.

Universal also sponsors a number of scholarships for dispatchers, via NBAA’sSchedulers and Dispatchers Committee and through such organizations as Women in Corporate Aviation (WCA) and Women in Aviation (WIA). “We have a very high success rate with these,” adds Martin. “It’s our way of helping these communities and helping develop the careers of tomorrow’s Business Aviation dispatchers.”

DISPATCHING 101
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Universal also sponsors a number of scholarships for dispatchers, via NBAA’sSchedulers and Dispatchers Committee and through such organizations as Women in Corporate Aviation (WCA) and Women in Aviation (WIA). “We have a very high success rate with these,” adds Martin. “It’s our way of helping these communities and helping develop the careers of tomorrow’s Business Aviation dispatchers.”

Information at Your Fingertips
Rockwell Collins was in Long Beach with its ARINCDirect Flight Manager. The service brings together all relevant pre- and post-trip international planning features and capabilities into one online location or app. Working seamlessly with dispatch and scheduling software, ARINCDirect Flight Manager provides planners, dispatchers and flight crews with up-to-the-minute information on everything that will affect a flight anywhere in the world. From storms over the North Sea to fuel shortages in Peru, ATC strikes in France or runway closures in the US – everything is available in a single location, including:

- Trip tracking through various formats – calendar view, folder view, global view and advanced search features

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We're on the ground, talking with Russian authorities daily to stay on top of the latest operational information and changes—so you can make the best decisions for your trip and set expectations with your stakeholders.

And beyond supporting you with planning and coordination, we’ll be there when you arrive to provide the extra on-site attention needed to take the stress and risk out of operating to Russia during this high-traffic period.

Speak to an expert at Universal® Exhibit #O90 during EBACE 2018, or get a trip cost estimate at russia2018@univ-wea.com.
Euro Jet provides AOG services (top). Cutter Aviation is the oldest family-owned FBO in the US (center). ARINCDirect bizav solutions (below).

- Instant access to status of trip permits, handling notes, fuel releases, hotel confirmations, weather and flight plans
- Carbon emissions monitoring and tracking
- Fuel pricing by location and online fuel ordering
- Easy access to ARINCDirect card statements, invoices and budget reports
- Aviation tools that include airport locator, time and distance calculator, alternate airports and Fuel Stop Analyzer

- Database of travelers, documents and flight histories
  One of the most popular ways of accessing the service is via the ARINCDirect iPad app. Using the app, flight plans completed on the ground are automatically synchronized for convenient use. Users also have access to the most recent, up-to-date weather information and flight plans. All company documents are fully integrated with an enhanced PDF viewer, and all annotations to charts or flight plans are instantly shared with your co-pilot or dispatcher.
  Likewise, Universal Weather and Aviation's uvGO online allows operators to plan, build and manage missions worldwide. “Since we launched uvGO, we’ve received tremendous feedback and suggestions from our clients, which we continue to integrate,” says Universal Weather and Aviation Product Manager Kyle Tupin. “Usage and adoption have exceeded our expectations.”

With uvGO, users can:
- Create and manage single- and multi-leg trips from one convenient view
- Calculate and file flight plans
- View routes and weather on an interactive map
- Receive automatic alerts for potential issues impacting your planned trips
- Access information on permits, fuel, airports, FBOs, and even restaurants

The company has launched an iPhone version of the platform, giving users a third option in addition to the iPad app and online versions. With uvGO for iPhone, users have a very similar look and feel to what they already have in the online and iPad versions. They can access critical trip information and such capabilities as flight plans, worldwide weather, service confirmations, airport/FBO information, UVair fuel pricing, Satcom Direct (SD) FlightDeck Freedom datalink – and more. Because it is a true native app – as opposed to a web-based one – information is synced and stored locally for easy offline access.

uvGo is available for any operator that either works with Universal Trip Support Services, carries the UVair Fueling Card or has a Universal DIY online flight planning subscription with or without SD’s FlightDeck Freedom datalink added.

With schedulers and dispatchers continuing to assume more and more responsibility within corporate flight departments, shows like NBAA’s SDC will only continue to grow in importance. So be sure to mark your calendar for SDC.
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WHAT’S MY NAME AGAIN?

Nick Klenske takes a look at the highlights coming out of the Heli-Expo 2018

The helicopter sector that was on display at Heli-Expo was full of familiar faces going by new names. Bell dropped the Helicopters, MSH is now Kopter, Eurocopter goes by Airbus Helicopters and AgustaWestland prefers Leonardo.

But Heli-Expo 2018 wasn’t just a showcase for new names and logos, it was also a place for new products and new orders. With a focus on innovation and disruption, the helicopter industry looks well positioned for a strong future. Here, BART International takes a look at the highlights coming out of Las Vegas.

Just Bell

Textron Aviation sister company Bell Helicopter announced a complete makeover during Heli-Expo, unveiling a new name, logo and brand strategy. Now simply referred to as “Bell”, the helicopter manufacturer looks to put more emphasis on its involvement in flight in general (although helicopters will remain its...
core business). “Bell has always been more than just helicopters,” explains President and CEO Mitch Snyder. “Now our name accurately reflects this quest.”

The company’s new dragonfly and shield logo is meant to symbolize Bell’s ‘tenacious pursuit of flight’ and ‘reputation in reliability’. “The dragonfly can take off and land wherever it wants, fly quickly and efficiently in any direction, and hover at will,” adds Snyder. “It represents the mastery of flight, something Bell strives to achieve.”

More exciting news coming from Bell was the introduction of the Bell 407GXi, now the official successor of the existing 407GXP model. The Bell 407GXi – the “i” as usual standing for innovation – features a new Rolls-Royce M250-C47E/4 dual-channel FADEC engine and Garmin’s G1000 NXi integrated flight deck. The new avionics suite offers high-definition displays and faster processors, allowing for a quicker start-up and map rendering. The Bell 407GXi also comes with several new executive interior design options for its five-seat cabin. Already certified by Transport Canada, the helicopter’s first flight is expected to occur this Spring.

According to Kopter CEO Andreas Loewenstein, the rebranding comes at a time of growth and expansion. “To support that growth, and place us as a leader in our field, we need to be clear about who we are,” he explains. “By simplifying our brand, Kopter will be better placed to tell the world its story.” With a new name also comes a new tagline, and in the case of Kopter it’s “for missions accomplished,” underpinning the company’s everyday aim of an ongoing vision.

The newly named Swiss manufacturer proved to be popular during the show, mostly because of the P2 prototype of its all-composite SH09 light single helicopter that it was showcasing. During the event, the company received orders for 34 units – of which 21 were firm orders – for the helicopter. The SH09 is expected to obtain EASA certification in the first quarter of next year, with first deliveries slated for the second half of 2019.

Say Hello to KOPTER

Bell wasn’t the only company to rebaptize itself during the show. MSH (Marenco Swiss Helicopter) unveiled its new brand name: Kopter. Unmistakably, Kopter immediately identifies with helicopter, but by using a ‘k’ instead of the ‘c’ it gives the name a Swiss-German look and feel.

STANDARDAERO KNOWS SERVICE

Noteworthy news on the MRO side of the rotorcraft market came from StandardAero, an authorized maintenance provider for the Rolls-Royce M250 engine, which powers a range of Bell, Airbus, MD and Sikorsky helicopters. During the annual FIRST Network Recognition reception, organized by Rolls-Royce, StandardAero received awards in the Customer Satisfaction and Program Investment categories. The former category marked the ninth consecutive year that StandardAero brought home the award, underlining its remarkable customer service. “Our customers are at the center of everything we do,” says StandardAero VP of Sales, Marketing and Business Development for Commercial Helicopter Services Manny Atwal. “From daily MRO activities to long-term program solutions and industry collaboration, this recognition from our partners truly serves as a reinforcement of that same focus we both share.”
edged as being a key feature. “The versatility and price point made it an attractive addition to a large number of rotary wing fleets, and we have put seven in service since committing to our first purchase in 2015,” he says. “The EC145e model has proven to be a workhorse across various mission profiles, and we are excited about putting these new aircraft into service.”

The company developed several FAA approved STCs for the EC145e as well, including a Visual Flight Rules (VFR) electronic flight instrument system (EFIS) and autopilot and stability augmentation system, expanding the rotorcraft’s existing capacity in the medical, law enforcement and utility segments. The OEM plans to produce the EC145e at its assembly line in Columbus, MI, after which they will be delivered at Metro Aviation’s Shreveport, LA, completion center for individual customization.

The other orders came from three Japanese operators, reinforcing Airbus Helicopters’ position in the far East. Marking the helicopter’s entry in the country, an ACH130 was ordered by Auto Panther, who also acquired the signature Styline interior that features a sports car inspired design. The company plans to use the helicopter for corporate and VIP transportation. Another light single H125 went to Noevir Aviation, who has been operating older models for some time for charter missions. Lastly, Nakanihon Air Service placed an order for a H135 light twin, bringing the company’s total fleet of H135s to 20, all used for a wide array of missions.

“We are delighted at how our helicopters continue to play an important role across a spectrum of missions in Japan,” comments Airbus Helicopters Japan Managing Director Olivier Tillier, who attests that Japan is a very important market for the OEM, with five units ordered in the first quarter of this year alone.

**Strong Showing for Leonardo**

Like Airbus Helicopters, Leonardo had already gone through the name-change process. In 2015, the OEM dropped its Anglo-Italian name AgustaWestland and opted for a clear reference to 15th-16th century Italian
inventor Leonardo Da Vinci, acclaimed to be the creator of the first helicopter.

The company had a strong showing at Heli-Expo, closing the show with combined orders for 17 aircraft, valued at slightly less than EUR 140 million. The orders were placed by operators from all over the world and for helicopters of all shapes and sizes. For example, the popular AW169 and AW139 were sold in emergency medical service (EMS) configuration. One EMS AW169 went to UK-based Specialist Aviation Services, who already has seven Leonardo helicopters in its fleet and plans to increase the number of AW169s to 12. Another AW169 was ordered by German HeliService International for utility missions in the North Sea. The company already has two of the same rotorcraft in its fleet.

Sloane Helicopters, Leonardo’s official distributor in the UK and Ireland, marked the entry in Northern Europe of the AW109 Trekker by placing an order for one unit, in addition to a AW109 GrandNew in VIP configuration. Another GrandNew went to Kaigai Corporation of Japan. Kaigai is also an official Leonardo distributor, next to Mitsui Bussan Aerospace. Leonardo signed a renewal of its distribution agreement with the later for the upcoming three years. Contrary to Kaigai, the agreement with Mitsui features the AW139, AW169 and the AW189 models. To butter the agreement, Mitsui also placed an order for an AW189.

The Italian OEM not only proved to be popular in Japan, but also on mainland Asia. China-headquartered Sino-US placed a staggering order for 26 helicopters, which was signed during the Expo. The order includes several of the company’s products, including seven AW119Kx, 15 AW109 Trekkers and four AW139. The deal is valued at $147 million.

On the other side of the planet, Argentina-based Flight Express put down orders for an AW119Kx and an AW169 in VIP configuration as well.

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Deliveries Up at Robinson

At the Robinson Helicopter booth, the company discussed how it produced and delivered 305 helicopters last year, substantially more than the 234 it delivered during 2016. Its R44 led the way with 174 units – making it the best-selling helicopter of the year. The R66 followed with 77 units, and the R22 came in third with 34.

Robinson brought a R44 Raven II, R44 Cadet and R66 to the Expo in Vegas. The R66 featured a limited-edition paint scheme, new optional heat-
ed seats and Garmin’s TXi display system. The company also had installed its recently introduced cargo hook and wire strike protection kit on the R66.

**Sikorsky Signs with Era Group**

Similar news came from Lockheed Martin affiliate Sikorsky, which prided itself on delivering the 300th S-92 helicopter. The hand-off was officially signed during a dedicated ceremony with longstanding customer Era Group. The company took delivery of its first Sikorsky S-55 helicopter in 1956. The S-92 joined Era Group’s fleet of eight Sikorsky in March in the Gulf of Mexico to perform offshore missions.

Commenting on the delivery of yet another Sikorsky product was Era Group President and CEO Chris Bradshaw: “In the year of Era’s 70th anniversary, we are thrilled to enhance the safety and availability of our fleet with another Sikorsky,” he says. “The reliability of the S-92 provides the consistency our mission requires.”

“Sikorsky and Era have partnered for more than 60 years and [we] have been honored to be a part of Era’s mission of providing safe, efficient and reliable transportation,” adds Sikorsky President Dan Schultz. “We have a rich history together, and with the delivery of this aircraft, we look forward to an even brighter future.”

**MD Helicopters Looks to Disrupt**

American OEM MD Helicopters brought two of its single-engine helicopters to the show, both of which featured all-glass cockpits. An MD 530F in law enforcement configuration stood aside an MD 530G Attack Helicopter ordered by the Malaysian Ministry of Defense.

According to MD Helicopters CEO Lynn Tilton, the rotorcraft industry’s customers only want two things from helicopters: design and disruption. “The aircraft on display at Heli-Expo this year reflects well that this philosophy has been embraced by our company,” she says. “MDHI has demonstrated it is equally committed to delivering the elegance of design and disruptive technologies as excellence in product performance and customer support.”

Tilton may be on to something, not only for her company, but for the industry in general. Considering the range of new, innovative products and out-of-the-box thinking on display at Heli-Expo 2018, the rotorcraft industry looks set to redefine what a helicopter is, redesign its capabilities and, as a result, disrupt how we move around.
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AERO 2018 HOMEBASE OF GENERAL AVIATION

AERO 2018 in Friedrichshafen was definitely worth a visit. Just ask the over 31,000 people and 630 exhibitors from 38 countries that were on hand at this year’s edition. Volker K. Thomalla reports

Bell 505 Jet Ranger X Makes Debut

Another aircraft making its debut at AERO 2018 was Bell’s new light single helicopter, the Bell 505 Jet Ranger X. The rotorcraft has never been shown at a trade show outside of North America. The stop at AERO was part of its European demo tour, which started just days prior to AERO in Belgium. The helicopter is powered by an Arrius 2R engine, which produces 504 shp. Bell started delivering the Jet Ranger X in March of last year.

While the majority of the aircraft so far have been delivered to customers in North America, the first units have made their way to Europe. Two 505s have been handed over to customers in the UK, two are flying in Poland, and each one in Denmark, Sweden and the Czech Republic. The Jet Ranger 505 X will continue its demo tour in Europe until mid-July before heading to the Middle-East.

HondaJet Delivers

Rheinland Air Service (RAS) of Mönchengladbach, Germany, hosted the display of Honda Aircraft’s HondaJet. The light jet, which in 2017 was the most-delivered type in its class, is proving popular in Europe. HondaJets have already been delivered to European customers, with the most recent delivery being to the Polish company Chopin Vodka, which offers the aircraft for private charter in Eastern Europe and charter throughout Europe.

Wijet, a French executive charter company, is also a fan of the HondaJet, having ordered 16 in February. Currently preparing the jets entry-into-service, the aircraft will be registered...
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in the UK and will replace the company's fleet of Citation Mustangs within the next 18 months. While hiring pilots is not a problem, getting training slots for the type rating is a challenge. As a result, Wijet is working on ways to train new pilots on the aircraft.

In early April, it was announced that Honda Aircraft will be honored by the American Institute of Aeronautics and Astronautics (AIAA) with the 2018 Foundation Award for Excellence. This award acknowledges the company's accomplishments in the aerospace community, including leading the design, development and commercialization of the HondaJet.

### Embraer Expects Growth

Atlas Air Service of Bremen, Germany, had an Embraer Legacy 450 and a Phenom 300 on display. The company was satisfied with the results of the show. "The growth we expect in our industry has been reflected in the positive response from visitors," says Atlas Air Service CEO Dr. Nicolas von Mende.

Atlas was hoping to show the brand-new Phenom 300E in Friedrichshafen, but the aircraft was delivered at the time of the show from Embraer's Melbourne, Florida, facility. The Brazilian manufacturer had handed over the first new Phenom 300E in late March. The aircraft has received its type certificate from the FAA, EASA, and the Brazilian ANAC. The new light jet model was launched at the 2017 NBAA-BACE. The new aircraft is designated "E" for "Enhanced" in reference to its entirely redesigned cabin and the addition of the nice HD Cabin Management System/InFlight Entertainment by Lufthansa Technik.

### Big Plans at Cirrus

For the first time, Cirrus Aircraft had a Cirrus SF50 Vision personal jet on display in Friedrichshafen. The company had just been awarded the prestigious 2017 Robert J. Collier Trophy from the National Aeronautic Association (NAA) for developing the world's first single engine Personal Jet and implementing the Cirrus Airframe Parachute System (CAPS) on the aircraft. "At Cirrus Aircraft, we are honored and humbled to be awarded the 2017 Collier Trophy and to even be mentioned among the giants in aviation and space research that have won before us," commented Dale Klapmeier, Cirrus Aircraft Co-founder and CEO.

At the opening day of the show, the company announced that Ben Kowalski had been promoted to Senior Vice President Sales & Marketing. Kowalski reported that the company has delivered 35 Cirrus SF50 Vision so far and that it plans to deliver 50 units of this type in 2018. In 2019, the production will rise to 75 units. The manufacturer has partnered with CAE to develop and manufacture a full-motion simulator for the type. The simulator has already been accepted by Cirrus and is being installed in Cirrus' Knoxville facility. Cirrus plans to start pilot training according to FAR 142 in the summer. Today, 80 pilots have qualified to fly the SF50 Vision.

### TBM – There’s an App for That

At AERO, Daher launched a smartphone app for TBM aircraft owners and operators. That app, called "Me & MyTBM", is available for iOS and Android and should significantly enhance operating efficiency, optimize maintenance management and ensure that the operators are flying their TBM aircraft to the highest safety standards. "The 'Me & My TBM' app provides unique and valuable feedback on TBM flights, from key parameters of the engine and other
YOUR CLIENT travels thousands of miles every year.

They want a plane that is the perfect balance of speed, efficiency, and comfort.

Find exactly what they’re looking for.
systems to a full range of statistics accessible wherever the aircraft goes,” says Daher Airplane Business Unit Senior Vice President Nicolas Chabbert. “This eliminates the need to send flight logs, as well as trend and report data files to the CAMP maintenance tracking system, avoiding the task of downloading data on a computer.”

In addition, Chabbert noted that advanced customer support is now available, but only if the operator chooses this option. The “Me & My TBM” app gives TBM Care teams the capability to access and analyze all flight parameters in less than one hour after a flight. “The ‘Me & My TBM’ app’s current version is just a first step,” adds Chabbert. “We are committed to further developments, offering TBM owners and pilots more personalized services in the future: predictive maintenance, proactive support and auxiliary services.”

The new app is available now for all TBM 910 and TBM 930 Model Year 2018 aircraft. The manufacturer is also looking to implement it into existing aircraft.

Piper Goes Diesel

Piper Aircraft has confirmed the sale of the first Piper M600 into Europe during the opening day of Aero Friedrichshafen and following the first customer M600 demonstration given in the region. As Piper rides a wave of trainer aircraft demand, it also announced at Aero in Friedrichshafen, Germany, that it will offer a diesel version of its PA-44 Seminole. The new model will be powered by a new Jet-A engine model from Continental Motors, the 170-HP CD-170, a variant of Continental's CD-100 series diesel engines.

According to Piper’s Simon Caldecott, the Seminole DX will be equipped with counter-rotating props to eliminate the need for critical-engine training. As are the current Diamond twin diesels that precede it, the Archer DX will have single-lever power controls and autofeathering propellers. The panel will include Garmin's new G1000 NXi EFIS system.

Blackhawk Brings World's Fastest King Air to Europe

Turboprop conversion specialist Blackhawk Modifications came to AERO with news that the company has received EASA approval for their King Air 350 XP67A Engine Upgrade. The upgrade includes two factory-new PT6A-67A engines and two new 5-blade composite propellers from MT-Propeller, which meet the stringent EASA noise level requirements. “We are pleased to bring the world’s fastest King Air to Europe as a practical replacement to many jets,” says Blackhawk President and CEO Jim Allmon. “Operating the XP67A-powered King Air 350 in Europe will result in comparable block times as many jets, but at a much lower operating cost.”

Avionics Alert!

Avionics was a hot topic at AERO 2018, with the ADS-B mandate deadline in Europe and the US quickly approaching. In the US, ADS-B functionality is mandatory for aircraft from December 31st, 2019. In Europe, aircraft that are faster than 250 knots and/or have a MTOW of more than 5.7 tons have to be equipped with ADS-B transponders starting June 20, 2020.

Avionics manufacturers like Garmin and Bendix/King, as well as MRO companies, showed off their solutions for customers to comply with the upcoming regulations. “For Garmin, AERO is a huge success, like always, especially this year, as we have some completely new products with us for the first time,” says Garmin Sales & Marketing Manager Trevor Pegrum. “As the largest and for us the most important aviation show in Europe, it holds a very prominent position for Garmin and brings us together every year with established customers as well as interested visitors to our stand and at the seminars.”

According to Pegrum, one thing above all connects AERO visitors and exhibitors: the passion for flight. “That is why we really value AERO and will of course be back next year,” he says.

AERO 2019 will take place April 10 to 13.
The Air Law Firm LLP is a boutique aviation law practice providing international legal services to the aviation industry. Our practice model sets us apart: we offer a bespoke and focused service from an agile and responsive team who can react quickly to the changing demands of your business environment.

Firm
The Air Law Firm LLP is a boutique aviation law firm providing international legal services to the aviation industry.

Practice
We have an in-depth knowledge and understanding of the global aviation industry including the operational, regulatory, commercial and insurance sectors.

People
We are international lawyers, qualified in various jurisdictions and are independently recognised as leading experts in our fields.
Tell us about Euro Jet and what makes the company unique?
A The uniqueness of Euro Jet is that we are the only company in our kind of trade with a network of ground handling support stations located in an area serving up Central Europe, the Balkans, Baltics, Belorussia, Central Asia, and even Pakistan. Our own local ground support representatives in each one of these countries not only speak the local language, but are also fluent in English. They all fully understand that the services we support on every trip need to be performed flawlessly. These include all details from handling support and coordinating the fuel truck to double checking the catering and transporting crews to their hotel. Everything must be done in a seamless way where the customer never has to worry about anything.

What do you consider as a major reason for the success of the company?
A All across the years, taking care of the client has been the number one priority of Euro Jet. Everything we do is based upon ensuring that our customers are 100 percent satisfied. Over the past 10 years the company has worked to hire the best people both in our 24/7 OCC and those on the ground working indefatigably, making sure our customers get the best possible service.

What other things have you done to enhance the customer experience?
A One of the things we are very proud of is that we invest heavily in getting our team members trained on NATA’s Safety First Program. Even though our team members already have years of experience in aviation, have gone through internal Euro Jet training, and despite their respective airport trainings to be fully badged, we believe that Safety First adds an extra layer of safety and security training that is of the utmost importance. I also have to mention that we have complimentary crew lounges throughout our region. They are all part of our dedicated effort to provide Euro Jet customers something extra special enhancing their experience. Our lounges are located throughout Belgrade, Bucharest, Constanța, Dubrovnik, Karlovy Vary, Poprad, Prague, Sofia, Tivat, Warsaw and Zagreb.

Is there something that surprised you the most since you have been at Euro Jet?
A The loyalty of our customers. Based on the work we have done, this should not be surprising at all! This is a tough industry. Customers typically come and go, but ours really do stay. Being in charge of sales, I cannot complain, this is a good thing, but certainly a testimony of the hard work of everyone in our company.

On a personal note, is there a location where Euro Jet is located you like the best?
A It is hard to answer this without offending those I do not mention. I have to mention Prague, where our 24/7 Operations Center is based plus we have two VIP lounges, a ramp car, tow bar and even a very large hangar. I also really like Budapest that I consider as one of the most beautiful cities in the world. Some other honorable mentions include Poland – I really like Warsaw and Krakow, and of course Croatia and Montenegro, two Adriatic countries that will continue to see an upward growth in tourism. My apologies to the other locations I have not mentioned because I could go on and on forever.

How do you see Euro Jet continuing to grow even further over the next 10 years?
A Euro Jet will continue to grow with one thing in mind...and that is the 100 percent satisfaction of our customers. So whether it is opening up new lounges, investing in more people, strengthening our 24/7 operations center and of course increasing our network, we will continue to do whatever is best for our client. I am confident that with this attitude, we will enjoy continued growth over the next 10 years.

Any last thoughts?
A While I am being interviewed for this piece, I would like to mention that I am just the person promoting the dedication and hard work of our great team working under the guidance of our CEO Charlie Bodnar. Without them nothing would get done. But fortunately, we have an excellent team and things do get done very well!
precious and fragile things need special handling
Tough

Properly flown single-pilot IFR is relatively safe, but not necessarily easy.

IS FLYING SINGLE-PILOT EVER A GOOD IDEA?

It is a fact that having a pilot to load-share with you in command of an airplane is invaluable.

But is flying single pilot always a bad idea?

Capt. LeRoy Cook offers insight into flying solo and factors to be considered

For many years, nearly all jet aircraft, particularly those certified at more than 12,500 pounds takeoff weight, had to be flown by two pilots. The fact that equivalent piston and turboprops, which required much more work to fly, could legally be operated by a single pilot was ignored by hidebound rule makers. The bottom line was that flying at jet speed was an arduous endeavor, and one that required the assistance of a second pilot.

This thinking meant that when the first Cessna Citation business jets came online in 1971, they were certified as two-pilot aircraft. This was despite the fact that they had a cruise speed of 348 knots, only slightly faster than some turboprops, and a relatively light 10,850-lb takeoff weight. By design, the Citation’s cockpit was well-suited to single-pilot operation and its twin fanjet engines required little management. Thus, by 1977, Cessna had convinced the regulators that its jet was suitable for single-pilot operations, and an SP version of the Citation soon followed.

The dam had been broken, and all future light jet developments incorporated single-pilot certification as a matter of course.

Which brings us to the premise of this article: Is flying single-pilot a good idea?

A proper answer requires one to consider all the factors involved. Is the pilot suited (i.e., trained, experienced, healthy and rested)? Is the aircraft manageable? And is the flight environment anticipated to be stable and benign? Should there be any chance of one or more of these factors being compromised, then a copilot should be used. Not just carried, USED.

Risk management works by first considering the likelihood of an untoward outcome and then countering such likelihoods with operating standards that reduce the risk to an acceptable level. In aviation, risk management means ensuring the flight’s safe conclusion. After all, value cannot be assigned to the loss of key company personnel, and certainly the carriage of clients and prospects requires the utmost pursuit of safety.

Operating single-pilot might not be wise when such high-value individuals are being transported, and the flight department’s operations manual should be written to reflect extra care for such missions.

In reality, all such SOPs I’ve encountered specify the requirement for a second pilot whenever there are company passengers aboard, pure and simple. After all, safety starts with redundancy, and having a spare pilot in the cockpit is the best back-up system an aircraft can possess. I saw this first hand when I recently flew along on a trip in a firm’s Citation CJ4, carrying a client and the pilot-rated company president in the back. The firm’s full-time pilot, type-rated for single-pilot operation in the CJ, had me fill the copilot seat per company policy. Once we were on the ground, I was released from duty and able to go back to the cabin, leaving the pilot alone in the cockpit.

With policies like this in mind, we must consider whether a single pilot is EVER a good idea for ANY high-performance flying. Again, we return to the previously cited risk factors. The pilot obviously must possess the single-pilot type rating for the airplane but, more than that, his or her state of currency ought to be considered as part of the flight preparation process. If the pilot is still fighting his way through the after effects of an attack of influenza, it would make good sense to bring a second pilot along. A proper amount of rest, prior to and during the course of a multi-leg flight, needs to be thought of as a medical requirement. And the normal consequences of aging cannot be denied. Now in my eighth decade, I am the first to admit that I need more naps to supplement my superior flying skills!

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Flying successful single-pilot IFR has many ingredients, including preparation, organization and avoiding distractions.

A Nest for One

If an aircraft is to be certified for flight with a crew contingent of one, the cockpit must be set up so that all routinely-needed controls are reachable from the left seat. Originally, the FAA required “hands-free” communication, meaning a headset with push-to-talk capability had to be worn. Further friendly touches might include a remote transponder “ident” button on the control yoke and conveniently-mounted autopilot controls to avoid having to divert attention to the aft center pedestal. As much automation as possible should be used to shed workload, such as integrating pressurization management with the FMS, automatically turning anti-ice equipment on and normal “lights out” systems annunciation.

High altitude flying, necessary to attain the jet aircraft’s performance objectives, carries with it exposure to a hostile environment not conducive to human life. Should there be a need to reach a breathable atmosphere, the single pilot must be able to execute a rapid descent and see to his own life support while simultaneously interfacing with air traffic control, locating a viable alternate airport and dealing with an unanticipated set of weather considerations. Needless to say, dealing with such an emergency would be much easier with an extra set of hands as a resource.

As everyone knows, some flights are just easier than others. Operating single-pilot on the first trip into an unfamiliar ATC environment, for example, probably isn’t a good idea. There are also some regions, even if regularly visited, that demand the use of a second pilot due to the traffic, routing and complexity that will be encountered. If you aren’t comfortable charging into an unknown or high-pressure environment, setting up the flight as a two-pilot operation is always the better choice.

Weather flying also increases the workload, not just from having to wrestle the airplane around in bumpy clouds, but also because serious weather will bring more complex ATC interaction. Clearances get revised, runways will be changed, and more traffic must be squeezed into less usable airspace. These are the times when a second pilot will be welcome. Yes, when the weather is benign and the trip is easy, it’s quite possible to operate the jet or turbo-prop with a single-pilot crew, relying on the automation to do most of the flying while operational decisions are left to the sole human in the cockpit. But what happens if the autopilot fails? Will you be comfortable hand-flying to a weather-challenged destination, perhaps with passengers tapping you on the shoulder?

It Usually Takes Two

Sure, if all goes well, a single-pilot operation is easy and simple. It’s when things don’t go well that the extra crew member is vital. To mitigate against this risk, most of the time two pilots are considered the norm in corporate flying. The single-pilot option is exercised only when an airplane needs to be repositioned over a relatively short route, with no passengers in the back, or when being test flown for maintenance reasons. In some training situations, only one pilot may be legally qualified to operate the aircraft, requiring single-pilot privileges as a temporary measure.

Operating standards are set by the regulatory agency of the country in which certification for the aircraft is sought, as well as the regulations governing the type of operation. On top of this there are the company policies that tend to demand a second pilot. So as a rule of thumb, we can say that commercial for-hire jet operation usually requires that there be two pilots in the cockpit.
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Pilots can use any tools at their disposal to help judge how close they get to the other aircraft, but at the end of the day, it all comes down to scanning the sky and paying attention. Michael R. Grüninger and Capt. Carl C. Norgren examine the deadliest aircraft disaster in California history.

The Mid-Air Collision

The 25th of September 1978 started as a hot sunny California day.

Three of the airports that are located in the San Diego area play a role in this case: Lindbergh, Miramar and Montgomery.

San Diego International Lindbergh (KSAN) is a tower-controlled IFR airport. Montgomery-Gibbs Field (KMYF) lies north of San Diego and is a VFR airport. Montgomery lies at the southern edge of the control zone of Miramar Naval Air Station. The field opened in July 1940 as “Gibbs Field” as an all-way clay and gravel surface airfield. In 1950, it was renamed after John J. Montgomery, an aviation pioneer who made the first manned, controlled, heavier-than-air flights in the United States from Otay Mesa near San Diego, starting with a glider designed in 1883. William Gibbs (1910-2016) was the man who founded the airport in 1940, as Wikipedia informs us.

On September 25, 1978, a flight instructor of the Gibbs Flite Center and another certificated pilot took off from Montgomery with the intention of performing some instrument flight training at Lindbergh. At 08:57 PST,
the Cessna 172, N7711G, ended as the second approach to Runway 09 and began a climb-out to the northeast while being in contact with the Sand Diego approach control.

At about the same time, Lindbergh Tower instructed Pacific Southwest Airlines Flight 182, a Boeing 727, to perform a visual approach to Lindbergh’s Runway 27. When the airliner was on a right downwind 27, ATC advised the airliner that there was conflicting traffic. In fact, the out-bound Cessna and the inbound airliner were flying both almost in the same direction on the North side of Lindbergh. The airliner’s flight crew looked out, but probably saw another Cessna and not N7711G climbing out. Both conflicting aircraft flew in parallel.

At 09:01, the Cessna pitched up in a wing level attitude, while the airliner slightly banked to the right. The Cessna collided with the right wing of Flight 182.

The Cessna broke up immediately and exploded. Flight 182 began a shallow right descending turn, leaving a trail of vaporlike substance from the right wing. A bright orange fire erupted in the vicinity of the right wing and increased in intensity as the aircraft descended.

Both aircraft were destroyed by the collision, in-flight and post-impact fire and ground impact. Out of the 137 persons on both aircraft, there were no survivors. Seven people on the ground were killed, and 22 houses and apartments were damaged or destroyed.

Losing Separation While Looking Out
Prior to the mid-air collision, ATC had issued traffic advisories to Flight 182. At the time, there were two Cessna aircraft flying in front of the airliner. The airliner flight crew detected one of the two. But the pilots then got confused and lost visual contact. Despite all attempts to identify the conflicting traffic by looking out, the flight crew was not 100% certain whether they had cleared the traffic.

30 seconds prior to the collision, the first officer, who was pilot flying, asked: “Are we clear of that Cessna?” The flight engineer said “Supposed to be”; the captain said “I guess”; the forward jump-seat occupant said “I hope”. These words seem surreal. But how many times did we say or think the same when acting as pilots?

26 seconds prior to the collision, the captain said: “Oh yeah, before we turned downwind, I saw him about one o’clock, probably behind us now.” Thereafter, the first officer ordered: “Gear down”.

9 seconds prior to the collision, the first officer said: “There’s one underneath,” and then 1 second later, he said: “I was looking at that inbound there.”

While he spoke these words, the conflict alert warning began in the San Diego Approach control facility, indicating to the controllers that the predicted flightpaths of Flight 182 and the Cessna would enter the computer’s prescribed warning parameters. At the time of the collision, the
approach controller advised the Cessna pilot of “traffic in your vicinity, a PSA jet has you in sight, he’s descending for Lindbergh.” This transmission was not acknowledged.

Unexpected to Stakeholders
The stakeholders were unsuspecting of the high risk they were exposed to.

ATC believed the airliner had the Cessna in sight. The crew had reported a traffic ‘in sight’. In fact the traffic in-sight was not the conflicting Cessna. In addition, the complex airspace in San Diego is segmented in various traffic zones for the many airports in the vicinity. The various ATC facilities had agreed on certain air traffic management procedures to streamline traffic and avoid misunderstandings. Contrary to Miramar Order NKY 206G, the approach controller at San Diego approach control did not direct Flight 182 to maintain 4,000 ft or below until clear of the Montgomery Field airport traffic area. However, the controller argued that neither of the two aircraft was within the Montgomery Field airport traffic area.

The flight crew of the airliner believed they had overtaken the Cessna. And yet, the flight crew of Flight 182 had received three traffic advisories and was on a visual approach in VMC under an IFR flight plan. Regulations and airmanship require the crew to “see and avoid” other aircraft. The crew’s initial response to the advisories indicated that they did not see the aircraft and were looking for it. When advised of additional traffic, one minute prior to the collision, the captain told the controller traffic in sight. Now the approach controller cleared Flight 182 to maintain visual separation and to contact the Lindbergh Tower.

“Maintain-visual-separation” requires that the pilot separates his aircraft from the traffic that has been pointed out to him. The question arises as to whether the flight crew was referring to the Cessna pointed out by the controller when they called “traffic in sight”. The Cessna had not received any traffic advisories apart from the one when it was already too late.

The victims on the ground had no idea of the drama unfolding in the skies, until it was too late for them.

Confusion and Cockpit Visibility
While ATC had pointed out two other aircraft to Flight 182, there was more traffic in the area. The traffic situation was complex at the time. In addition, cockpit visibility was limited. A cockpit visibility study showed that the Cessna might have been masked by the B-727’s cockpit structure. The pilots could not see it unless they either leaned forward or raised their seats, or both.

Even had they done this, it would have been almost impossible to spot the Cessna. The Cessna was now on virtually the same course as Flight 182 and with little or no relative motion, the target would have been almost impossible to detect and to maintain visual contact with.

The NTSB report concludes: “In retrospect, there is little doubt that the controllers were misled by their belief that Flight 182’s flight crew were visually separating their aircraft from the Cessna and by their previous experiences with similar conflict alerts where-in no action on their part was necessary.”

Ensuring Separation
Loss of separation is clearly a major hazard. Any safety management system will have picked it up. Two main mitigating actions have been set-up: Air traffic control and the See-and-Avoid policy assisted by modern technology, such as a TCAS.

Controllers will advise pilots on conflicting traffic and provide course corrections to ensure no collision occurs. In VMC, controllers might require the pilots to maintain visual separation. Traffic advisories will alert the pilots on where to look for potentially conflicting traffic.

Alert Fatigue
Pilots get traffic advisories frequently and almost never need to change course or take any other action based on such an advisory. This leads to alert fatigue. Although an alert is received, the action triggers no urgency. How many times did the alert disappear even without any action by the flight crew?

However, the alert should have caused the pilots to take swift action. The first action should have been to look out. If the other traffic is not in sight, any maintain-visual-separation instruction cannot be accepted.

Visual Detection
Tracking one small, fast moving target is a very demanding task. When there is little relative motion, it becomes even harder. The glare from the sun and hazy visibility conditions can add further challenges. When multiple targets are added, the task quickly becomes too demanding for a pilot to accomplish in addition to his duty of controlling the aircraft.

The advent of drones has added a further layer of complexity. Their size makes drones almost impossible to detect visually at a distance and to allow effective evasive action to be taken. The see-and-avoid principle did not prove sufficiently reliable in 1978 and is even less so in the increasingly crowded airspace of 2018.

“Maintain visual separation” might just not be a viable mitigating procedure any longer.

Michael R. Grüninger is managing director of Great Circle Services (GCS) Safety Solutions and Capt. Carl C. Norgren is a freelance contributor to Safety Sense. GCS assists in the whole range of planning and management issues, offering customized solutions to strengthen the position of a business in the aviation market. Its services include training and auditing (IS-BAO, IOSA), consultancy, manual development and process engineering. GCS can be reached at www.gcs-safety.com and +41-41 460 46 60. The column Safety Sense appears regularly in BART International since 2007.
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